

THE IRON AGE

DUCTION -- MANAGEMENT

OCTOBER 5, 1933

PROCESSES -- NEWS

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THE IRON AGE October 5, 1933

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OCTOBER 5, 1933

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The New Deal in Steel

"AFTER codification, what?" This question is now uppermost in the minds of all iron and steel producers. They are trying to get their bearings in new surroundings. Has price competition been largely eliminated? Will competition in service, in quality, in technical developments and in merchandising take the center of the stage? Will older sales methods have to be scrapped? These and related subjects are discussed by the author.

THE first phase of codification in the iron and steel industry is nearing an end. Wages have been advanced, hours have been shortened, prices have been filed, extras have been revised, numerous commercial regulations have been adopted, an administrative personnel has been selected. An enormous amount of detail work, requiring the unremitting attention of many men, including the highest executives in the industry, has been completed. To date there has been little time for reflection; it is only now that iron and steel leaders are beginning to ask themselves what the new deal in steel really means in terms of competition.

It is obvious that time-honored competitive relationships have been disrupted and that the industry faces a reorientation of its selling methods. But generalizations are of little value to those responsible for sales. They must work out their selling programs in detail. They must be ready for every contingency.

Needless to say, all sales organizations are trying to get their bearings in changed surroundings. The first question that comes to their minds is whether price competition has really been eliminated. Already

By G. L. LACHER
Managing Editor, The Iron Age

they can see loopholes in the code which will permit evasion of the spirit, if not the letter, of its provisions. And, of course, there is the personal equation to consider. No code can change human nature. If code evasions should become common, it is conceivable that enforcement might break down, just as prohibition enforcement broke down.

However, it is unlikely that deliberate violations of the code will be frequent so long as costs are moving upward as rapidly as is the case now. Wage increases have added \$100,000,000 a year to the industry's payrolls. The adoption of a coal code will boost fuel costs. Continuing labor unrest in the bituminous regions adds a further element of uncertainty to complicate cost estimates. Quite apart from the possibility of imposing code penalties for selling below cost, there is no danger of an early reversion to ruinous price competition. New additions to costs are too great to be off-

set by savings growing out of increased business volume.

A Steel Paradox

The inverse relationship of volume and costs, incidentally, is the primary reason for the competitive excesses that have characterized the iron and steel industry. One of the paradoxes of steel is that, under conditions of unregulated competition, prices reach their lowest when producers can least afford to reduce their quotations. Fixed charges are exceedingly heavy in the industry. When operations are at their depression nadir, costs are much higher than when production is at its zenith.

It is the very fact that volume is so important that caused competition to become so demoralized. The ever-present hope of obtaining enough tonnage to cut costs to the break-even level tempted many sellers to "buy" business away from their competitors. Few stopped to consider that when competitors were deprived of their proportionate share of going tonnage, they would soon retaliate in kind, resorting to the same methods, some devious, some open, which the innovators had employed. Human nature being what it is, this kind of competition fed on itself. There was no way to

stop it except through a curbing of time-honored American individualism. Such restraints have been provided by the iron and steel code.

Price Competition Not Barred

Yet code restrictions do not bar price competition. One of the first steps taken under the code was to reduce the differential between Pittsburgh and Chicago prices on heavy rolled products from \$2 to \$1 a ton. While this move did not affect the general level of steel prices, which at present is rising, it did alter the competitive price relationship between the two largest producing centers of the country.

The time may come when other groups of producers, or individual companies for that matter, may decide to reduce their base prices independently of the rest of the industry. Nothing can prevent such action so long as the reduction is an open one and filed in conformity with code provisions. If the prices so named are suspected of being below costs, an investigation can be made and penalties imposed if proof is established. Yet there are few that anticipate any resort to such an inquiry except in extreme cases. Unless a uniform system of accounting is adopted for the industry, cost investigations are likely to be long drawn out and inconclusive.

How soon the present unanimity in the industry's price front will be broken is difficult to forecast. A survey of post-war trends suggests that competition will increasingly divide itself into two broad classifications—tonnage competition and quality competition. When business volume again reaches a point where the burden of fixed charges is sharply reduced, efficient producers will doubtless see the advantage of reducing prices to obtain a maximum tonnage. Total profits can sometimes be increased sharply by spreading a smaller unit profit over a larger tonnage. The steel industry's experience in the late 20's demonstrated that earnings

rose with volume rather than with price; and that lesson will not be forgotten.

Quality Competition and What It Implies

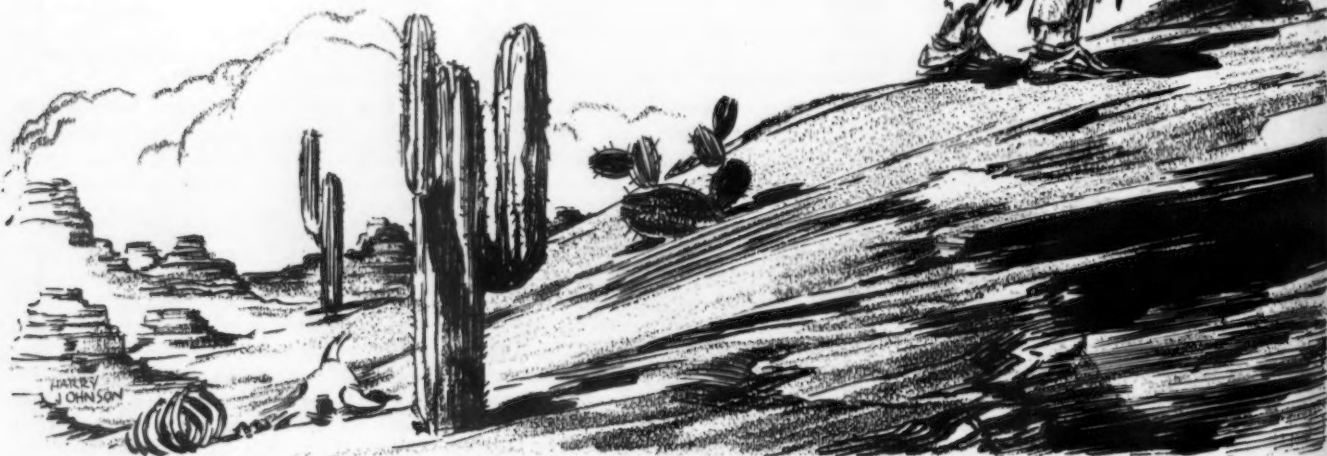
Quality competition, in the larger sense of all the forms of business rivalry outside of price cutting, will undoubtedly command the initial attention of the industry in the first phase of the code era. This new kind of competition will require an abrupt about-face for many sellers, whose chief stock in trade in the past has been shaving a price here or waiving an extra there. It will put a premium on adaptability and ingenuity. It will call for a conception of service that will mean far more than being a good fellow. It will require a more penetrating search into customer's requirements than loose estimates of their tonnage needs. Sellers of iron and steel will have to take a leaf out of the book of machine tool salesmen. They will have to learn to a greater extent than heretofore that the customer's business is the steel company's business.

The Rise of a New Type of Salesmanship

This kind of selling, it must be conceded, is not entirely new to the iron and steel industry. It has been employed with good effect in promoting the sale of the alloy steels, particularly the alloys in their latest form, the stainless steels. The merchandising of these products is on a high technical plane, being in the hands of men who are frequently metallurgists. With the increasing trend toward lighter, stronger and better materials in certain consuming industries, one can envision the time when young engineers will pass as naturally into steel merchandising as liberal arts graduates have gone into bond selling.

But emphasis on technical training will be no greater than the demand

for shop experience. Many steel salesmen will make good use of their intimate, practical knowledge of plant requirements. This knowledge will be acquired either through actual shop service or through systematic study from the outside. Probably one of the first moves of the keen sales force will be to make a new study of customers' needs, not from a mere statistical viewpoint, but with the aim of discovering all possible economies in the use of materials. A new kind of price competition is likely to result. Customers' inventories will be surveyed to discover whether certain classes of steel cannot be substituted for others so that extra charges can be reduced to a minimum. Elimination of revenue from extras cannot be regarded as disadvantageous to the mills—not if extra cards are in keeping with costs. Of course, that is another story. There is no denying that some extras have just "grewed



up" like Topsy and will be brought into line as the steel code grows older.

Finding New Uses for Steel

Any serious survey of a customer's existing uses of steel will usually disclose opportunities for the introduction of new uses for steel. Ways of substituting lower-priced for more expensive steels will suggest themselves, or economies through replacing cheaper materials with higher-quality products will be discovered. The possibilities are great.

Brash prophecies are always distasteful, but the writer believes there is little risk in predicting that the steel salesman of the future will be primarily an expert in the use of materials. In coming years, price chiseling will disappear from steel sales programs as completely as the methods of the oriental bazaar have passed out of American retailing. Prices will undergo changes, but those changes will not be under the control of individual sales representatives. Rather they will be dictated by broad company policies and, once made, will "stick."

With the passing of the "price approach," sales forces will perforce have to learn more about the quality of their products. While the code prohibits the delivery of a higher

quality than is specified at a given price, this provision does not alter the importance of having goods that have a reputation for serviceability, uniformity and finish. Pressure by sales departments on production departments is likely to increase in intensity. Shipping departments will also receive more notice, since promptness and freedom from mistakes will assume larger importance in the handling of deliveries.

Brand Names and Consistent Advertising

Greater attention to quality and service will automatically build up pride in the company's product. It will doubtless lead to a more widespread adoption of brand names, not for use as mere talking points but for better identification of products which have built up a reputation that should and can be capitalized.

Hand in hand with this tendency toward greater differentiation will go a more persistent and consistent advertising policy than has been pursued in the past. "Aha," observes the reader, "now the scandal comes out." It is true that this publication has a business interest in advertising, but it makes no apology for bringing up the subject. Intelligent publicity

through the press is due to assume a commanding position in steel company programs.

The palm in competition in the future will go to the sales department that knows its products, believes in them and everlastingly tells its customers about their virtues. Brand advertising will have its place, as will informative advertising designed to educate potential users. The still lingering belief that steel business is won or lost on friendship alone will pass. Open competition, decreed by the code, will quickly center the attention of the trade on economies in materials that can be obtained without resort to price cutting.

The game will be as fierce as ever, but it will be played under new rules. Doubters will continue to say that the rules will be violated, that the old game will be back with us in time. But such pessimism is a reflection on the best brains of the industry, which have labored without surcease to bring order out of competitive chaos. It is a reflection on American ingenuity, adaptability, and organizing genius. It is out of keeping with the present spirit of an industry which, after emerging from the vale of despair, sees the promised land of recovery and prosperity. Can it be that this new vista is a mere mirage?

Promised Land or Mirage?

STEEL, once rugged and powerful, has just emerged from the wilderness of ruthless competition. In the distance he sees the promised land of plenty, the land where orderly rivalry will replace price chiseling, where collaboration for the common good will replace crass selfishness, where constructive group regulation will replace destructive selfishness. Steel is not given to extravagant hopes. After years of trial he wonders whether the vision before him is a mirage, a delusion of his tired brain, or reality.



An Electric Power Famine Approaches

How Will It Affect Your Business?

WITHIN a very short time indeed, the industrial plant operator who purchases his electric power from a public utility is going to be balanced precariously on the proverbial horns of a dilemma. For, as production continues to pick up and he finds it possible once again to cut into the line more and more of his so-long idle machinery, he will find that the central station is very loath to meet his increased current demands unless he uses every possible effort to meet a large part of that increased demand out of the power he is already using!

In other words, the manufacturer must find ways and means to make his present power supply stretch to meet his increased needs, because there is practically no surplus generating capacity left in the central stations of the country today.

It is a situation that demands careful thought and deliberate planning now, because without such consideration of the factors involved, someone is going to get left out in the cold, wintry night without power to turn the wheels. A real famine in electric power is just around the corner. It is not possible under present conditions for the central stations of the United States to pick up all the industrial power load that has been lost in the depression years of 1930-1932.

If that statement surprises you, it came as a decided shock a couple of months ago to the gentlemen who make up the public utilities of the country. For, in the convention of the Edison Electric Institute (the new body which has succeeded the NELA) they had recently been discussing the idea that the central station generative capacity of the

By FRANCIS JURASCHEK

United States had been built up to the point where practically no additions would be necessary for some years to come. They based their conclusions on the fact that between 1929 and 1932 that generative capacity had been increased by 15 per cent and that, simultaneously, the use factor of the current generated had decreased by 24 per cent. On the surface, therefore, it appears that, on or about Jan. 1 of this year, more than one-third of the usable generative capacity of the central stations was idle surplus.

But, on July 1, *Electrical World* published a startling editorial headed "There is No Surplus Capacity," and on July 29 printed an amazing sheaf of figures to support that contention.

Utility Operators Are Worried

The complacency of the public utility operators was shattered. Some rapid calculations have resulted, and today, all over the country, representatives of the central stations that sell current to industry are actively engaged in surveying the present and prospective needs of their markets. You may be visited tomorrow and requested to submit your present and future electric power requirements to a searching analysis. And, in the course of this survey, the public utility representative will want to know whether the electricity you buy and pay for is being used to the best advantage, or whether certain minor

changes in your methods of use may not make it possible for you to use less current to better purpose.

What is back of all this? and how does it actually affect you? Why should there be a prospect of an electrical power shortage? and what can you do now to insure yourself against the day when you will need even more power than you are using? Here are the facts about the situation:

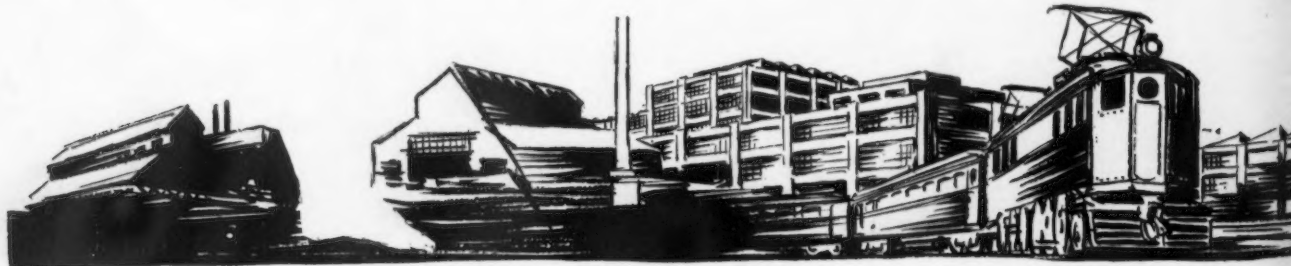
In the year 1929 B. D. (before depression) some 29½ million kw. of generator rating then existing in the public utilities of the United States produced a bit over 97 billion kw. hr. of electrical energy. If this same capacity had operated continuously at 100 per cent rating during the 8760 hr. of that year, it would have produced about 259 billion kw. hr. The actual use factor, then (or ratio of energy produced to the energy it was possible to produce) was over 37 per cent.

In the year 1932, some 34 million kw. of generator rating produced slightly less than 83 billion out of a possible 298 billion kw. hr., indicating a use factor of 28 per cent plus.

In brief, with 4½ million kw. added generator rating, the use of energy dropped 14 billion kw. hr., and the use factor decreased by 9 points, or 24 per cent. Such a picture would naturally cause the public utility men to think that America had over-built her central station capacity.

New Loads Added During Depression

But, under the surface, some surprising changes have been taking place. New loads . . . loads which were not in existence in 1929 . . . have been connected to the power lines



WE have been considering surpluses in production during the past few years and have given little thought to impending shortages. It will surprise many metal-working manufacturers to read that an electric power shortage impends.

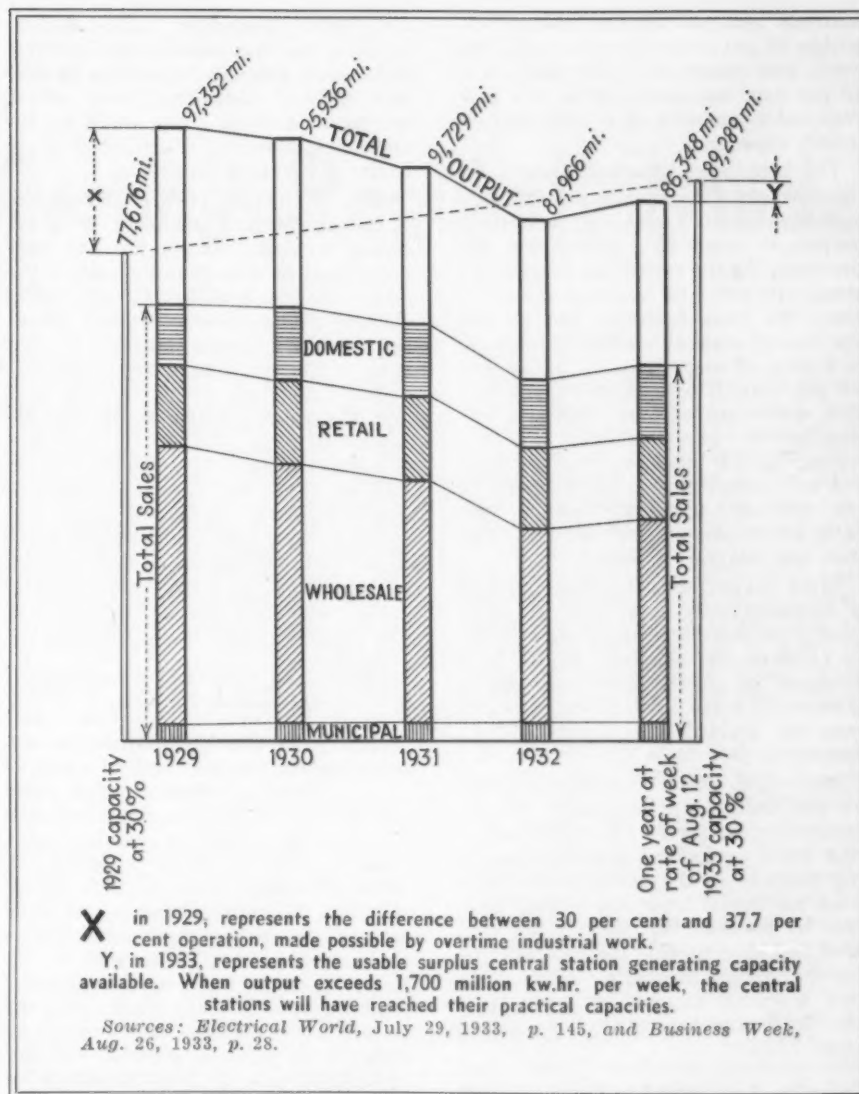
Increased load since 1929, due to domestic and commercial demands of a new nature, have outstripped new capacity by a considerable margin. It behooves the metal-working industry, so largely dependent upon power, to take notice.

For this reason, THE IRON AGE is publishing a series of three articles by Mr. Juraschek, calling attention to the situation and to what can be done about it. This introductory article states the problem. The two succeeding articles will suggest its solution.

of the country during the past three years; and these new loads are absorbing generative capacity today in amounts that are rapidly compensating for the industrial load drop of the depression. If this new absorption of generative capacity be considered in its rightful light, and to it be added the pick-up in normal industrial load already gained since the beginning of this year, together with the new conditions of operation occasioned by the workings of NRA codes, it will be seen that today surplus electric generative capacity is indeed a myth.

To understand the basis of this sweeping statement, a somewhat elementary explanation of the implications of the term "use factor" must be made. Although sometimes confounded with the term "load factor," there is an appreciable difference. As has been previously mentioned, the use factor is the ratio of the energy actually produced in a given period, to the total of the energy that could be produced if the station operated at 100 per cent of rating continuously during that period. Load factor, on the other hand, should refer to the ratio of maximum demand made upon the station during any one period, to the available capacity of the station.

For the public utilities of the country as a whole, about 80 per cent of the



energy produced is used during one-third of total number of hours in the week. This demand is made up largely of industrial uses, of current for municipal pumping, retail shops, office buildings, electric traction, and of some domestic use. Peak loads, calling for every kilowatt of available generative capacity, occur usually between the hours of 8 and 12 o'clock in the morning, and of 2 and 6 o'clock in the afternoon, except on Saturday afternoons, Sundays and holidays. Consequently, to supply more than 30 per cent (roughly) of the total possible weekly output means operating the stations during the periods of peak load demands at considerably more than rated generative capacities. Thus, for use factors in excess of 30 per cent there may be station load

factors considerably in excess of 100 per cent.

Concretely, in 1929 the use factor for the central stations of the country as a whole was over 37 per cent. This high figure may be explained partly on the score of lack of real surplus capacity (which was mainly responsible for the building of 4½ million kw. new capacity in the past three years) and partly on the score of the very large number of industrial plants then operating on over-time schedules, thus spreading heavy loads over night-time periods.

At present, not only is there little incentive for heavy over-time manufacturing schedules, but NRA is actually cutting down the normal work-week. Both these factors tend to con-



concentrate central station loads well within 30 per cent of the hours of the week, and consequently to establish a 30 per cent use factor as a safe and reasonable measure of central station usable capacity.

The present generative capacity of the central stations, measured by such a yard stick, is capable of a normal output of about 89½ billion kw. hr. per year. By the middle of August the steady increase in business activities since the bank holidays had pushed the use of central station energy up to a rate of more than 86 billion kw. hr. per year. If we compare this available difference of less than 3½ billion kw. hr. per year with the estimated 17½ billion kw. hr. per year sag still remaining to be taken up in the normal industrial demand, the facts which perturb the public utilities men may be readily seen.

With industrial production still at a comparatively low ebb, it is a matter of more than passing interest to examine the elements which have changed the electric power picture so generously since 1929. These elements may be divided into three distinct factors:

Municipal loads have increased by 16 per cent. This increase is due to extensions to street lighting, and to new waterworks and sewerage pumping stations in the main. Since, however, municipal loads are largely handled by stations that do not sell current to industry, this increase may be ignored except insofar as it has taken half a billion kw. hr. per year from the total generative capacity added since 1929.

Industry Has Added a 20,000,000 kw. Load

But, since 1929, hard-hit industry, struggling feebly to keep its head above the rising waters, has dug down into its multi-patched jeans for the wherewithal to buy enough new mo-

tors, motor-generator sets, electric welders, heating devices and electric furnaces to create a brand-new 20 million kw. of connected load, which means, at a 10 to 1 use ratio, an increased demand of 2 million kw. on utility generating capacity.

And, in the same depression period, Mr. and Mrs. Consumer, with no money to spend except for the bare necessities of life, found somehow the means to buy a sufficient number of electric refrigerators, ranges, washing machines, irons, toasters, curling irons, waffle irons, percolators, mixers, vacuum cleaners, clocks, heaters, fans and electrically operated oil burners and stokers to add 11½ million kw. of connected load to the utility lines; and at the same time so increased home lighting facilities over and above normal lamp replacement needs as to add another 10 million kw. of load. At a 10 to 1 use ratio new domestic demands absorb 2.25 million kw. of utility generating capacity.

Increased Load Has Cancelled Increased Capacity

Briefly, of the 4½ million kw. capacity added to the central stations since 1929, new loads created since then are absorbing today just 4½ million kw.; cancelling out completely the capacity increase, and throwing the utilities squarely back on their mythical 1929 "surplus capacity" to take care of the increased demands which the general pick-up in business activities will cause from now on. Consequently, since it takes about one year to add any considerable generating capacity to existing central stations, or to build new stations, increased industrial demands, plus the normal increase in domestic and lighting requirements due to the shorter days of fall and winter, must be met by considerably high load factor operation of the utilities.

It has been shown that present con-

ditions all tend toward establishing a 30 per cent use factor as the safe and reasonable ratio of central station operation. Today, demands for more than 30 per cent of the possible energy output of such stations will mean excessive peak load operation . . . costly to the utility not only in labor charges, but in maintenance and repair charges. In self defense, therefore, the utilities will use every endeavor to spread the demand more evenly and to level the peak loads to reasonable points. They will pound at the user whose demand greatly exceeds his constant use of current, and they will hammer at the customer who absorbs non-working "wattless current" by reason of low power factor operation, out of proportion to his real energy needs. They will do this because it will pave the way for them to meet the constantly increasing demands for more power when they have no longer the usable generative capacity available to produce more power.

Under these circumstances it behooves every manufacturer who buys his electric power from a central station to look the facts squarely in the face, and to determine now how he may be able to get more power for increased production needs when his central station hasn't got any more power to sell.

Four Approaches to Your Problem

There are four principal avenues of approach to this complicated problem:

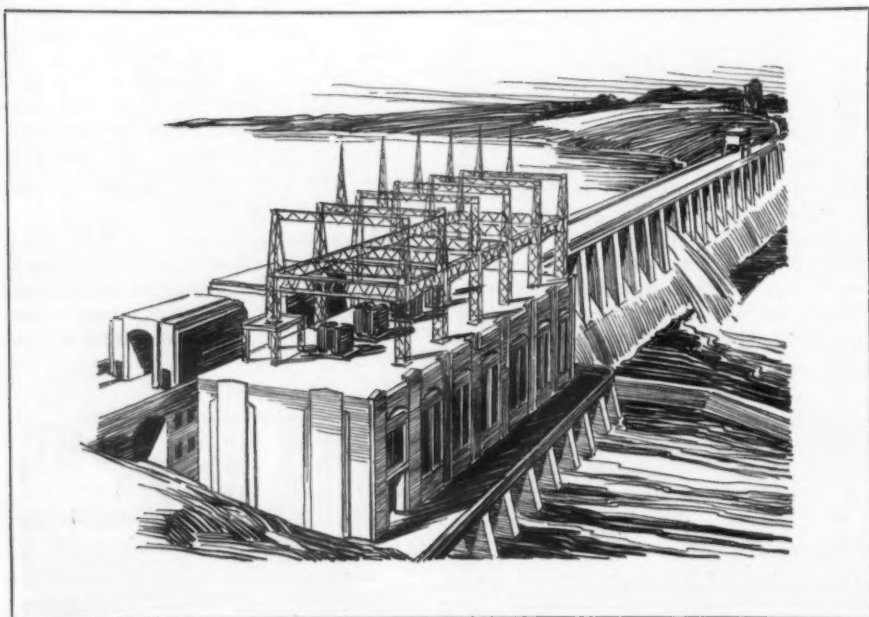
1. Do you operate at varying intervals at excessive peak loads, thus tying up just so much generative capacity as may be required to meet those high demands, over and above a fair, normal use of current? Careful planning, and the installation of automatic control equipment, may not only release a large part of that demand capacity for continuous, productive work, but also save you a great deal of money on your power bills.

2. Do you suffer from low power factor conditions? To balance the "wattless current" which these conditions set up takes an equivalent amount of generative capacity which could be turned into useful energy, either for you or for some other power user. Corrective equipment will give more power and save on power bills.

3. Have you many small individual motor drives in which the sum of the power consumed is greater than would be needed for the same operations arranged as group drives from a small number of larger motors? Analyses of such conditions will point the way to power savings.

4. And, finally, have you carefully weighed the pros and cons of private plant vs. central station power, with particular reference to the

(Concluded on Page 59)



Alloy Steel Castings Regularly Made

THE accompanying table shows a representative list of 15 alloy steels regularly manufactured for castings in the United States, according to A. W. Gregg, general superintendent, Bonney-Floyd Co., Columbus, Ohio. The significant portion of the chemical composition, the physical properties which can be produced and the heat treatment applied are included in the tabulation. The compilation featured a paper Mr. Gregg contributed this month in behalf of the American Foundrymen's Association to the Australian Bureau of Steel Manufacturers to outline developments in American practice. To it was joined a comprehensive discussion of the special precautions that have to be exercised in the molding, melting, heat treatment and cleaning processes. These observations also are here presented in full, so that the following is Mr. Gregg's paper substantially in full:

General Shop Practice

The most important difference in the shop practice for the production of alloy steel as compared with carbon steel consists in greater attention to detail in every department of the foundry. The same difficulties which occur in producing acceptable castings of carbon steel occur in an intensified manner in producing alloy steel castings. With most alloy steels there is a greater tendency for cracks (both hot cracks and cold cracks), shrink holes and porosity. Molding sands must be carefully selected, mixed and rammed. Baking temperatures and time of baking should be controlled by recording pyrometers. Pains-taking melting furnace manipulation and control of pouring temperatures are of vital importance. Heat treating if not properly performed may do more harm than good. Heat treating furnaces require good insulation and automatic temperature control. Provision for the rapid handling of hot loads from furnace to quenching tank is essential. Every department in the foundry will find that the production of alloy castings has introduced new problems which must be solved if a satisfactory product is to be produced.

Melting Department

THE production of alloy castings places the greatest burden on the metallurgical departments. The electric arc furnace is the most generally

used melting unit for the manufacture of alloy castings, and in the United States the large majority of furnaces are acid-refractory lined. The charge should consist of clean carefully selected scrap, phosphorus and sulphur contents should be well below 0.04 per cent and economy of operation dictates that the carbon content in the metal as melted should be not much over 0.25 per cent. Sufficient ore should be charged with the scrap or added when the metal is melted to produce a highly oxidizing slag, because it is necessary to produce a good lasting boil characterized by one or more periods of violent ebullition and a copious evolution of carbon dioxide.

When the bath has quieted down to a mere ripple a test sample should be

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HERE is a tabulation of alloy steel castings submitted as representative of current American practice by A. W. Gregg, of the Bonney-Floyd Co. With it are details of correct foundry procedure to meet the special requirements of the alloy products. The combined contribution, (which recalls one in THE IRON AGE of Feb. 2 by the same author describing a new heat treatment of carbon steel locomotive castings), is Mr. Gregg's answer to a request to cover American developments in alloy castings for a meeting of steel manufacturers of Australia.

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cooled and broken and the melter's judgment of the carbon content should be verified in the laboratory. If the carbon is too high more ore must be added and the boiling cycle repeated. At this point a new slag should be built up by additions of sand, broken brickbats and limestone in approximately equal proportions. When this new slag is thoroughly melted, a sample removed from the furnace should have a shiny black on the outside and the interior should be a dark green.

As the refining cycle progresses, the outside of the slag has a tendency to

become brown while the inside shows lighter tints of blue or green. Any tendency of the slag to become light brown on the outside indicates that silicon is being reduced in the bath at a very rapid rate, and this tendency should be stopped immediately or the heat should be tapped. To stop silicon reduction the eutectic balance of the slag must be disturbed, which can be done in some cases by an addition of sand and in extreme cases by sprinkling a little finely powdered iron ore over the surface of the bath.

It is necessary after making up the finishing slag that the bath be allowed time to recover the temperature lost by the addition of the cold slag making materials. When the bath is at about 2900 to 3000 deg. F., the metal should be recarburized by the addition of pig iron or by dipping the electrodes. When the carbon is at the proper percentage the final additions of manganese and silicon together with such alloys as chromium should be made. The use of silico-manganese is to be recommended and will produce a cleaner steel. In fifteen minutes the heat should be ready to tap. The use of aluminum as a deoxidizer is especially harmful resulting in loss of ductility and increase in shrinkage. Properly made steel requires little if any of this dangerous element.

Different alloys require different methods of addition to the bath. Nickel and molybdenum, which are not readily oxidized, should be charged in the furnace with the scrap. Chromium and manganese should be added about 10 to 15 min. before tapping time, and alloys which are as readily oxidized as vanadium must be added in the ladle.

It may be considered that undue emphasis has been placed upon the control of the slag, but any neglect on this score will result in metal which has a tendency to porosity and lack of ductility. If the slag is not carefully regulated, it is impossible to produce a good alloy steel no matter what alloy is involved.

Considerable latitude in pouring temperature is possible in the production of carbon steel castings, but in the manufacture of alloy castings it is of the utmost importance that the metal be poured at a temperature just high enough to avoid mis-run

castings. It is advisable to use an optical pyrometer to determine the temperature of the metal just before tapping the furnace, and the metal should be held in the ladle until it is cooled to the point where it will pour the work in question without leaving a skull in the ladle.

Heat Treating

THE majority of alloy steels have somewhat lower critical temperatures than carbon steel and the heat treating or normalizing temperatures should be based upon the critical temperature of the steel in question. Castings should be heated thoroughly to a temperature about 50 deg. above the critical and held at this temperature for not less than 2 hr. per in. of section. They should then be quenched either in oil or water, or air cooled. The castings must be reheated to a temperature below the critical temperature, but sufficiently high to remove cooling or quenching strains.

rometer equipment is essential if maximum possibilities are to be realized.

Pattern Making and Molding

PATTERNS for alloy castings must as a rule allow for greater shrinkage per foot than those for carbon steel. There is no standard rule for

duce castings accurate to the desired dimensions.

Because alloy steels have a greater shrinkage and because the steel is more "tender" and liable to crack at both elevated and ordinary temperatures, the molding and core making departments must take greater pre-

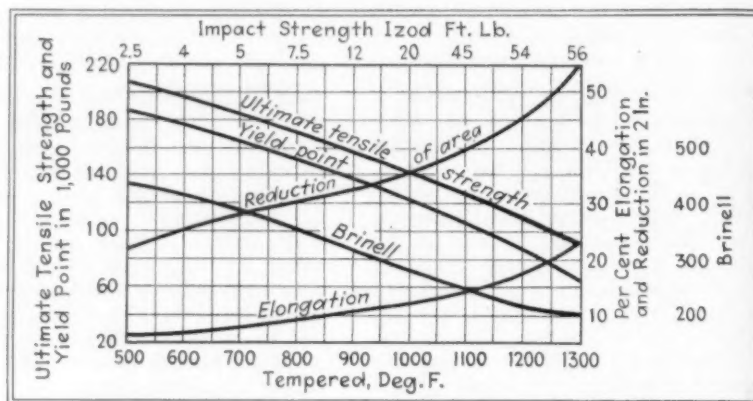


Chart No. 1—Properties of a manganese-molybdenum steel quenched in water from 1600 deg. F. and tempered through the range indicated.

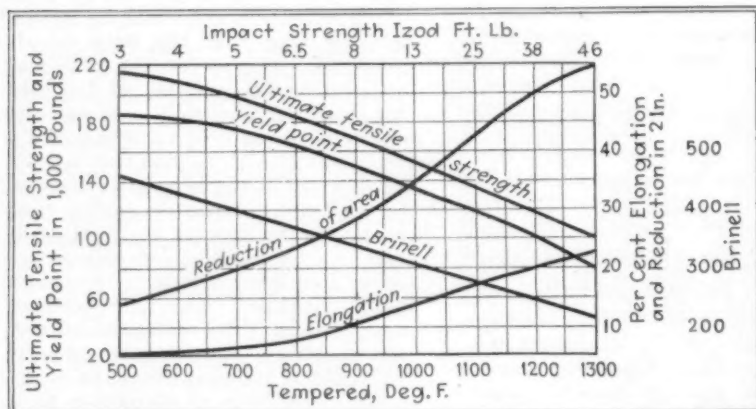


Chart No. 2—Properties of a nickel-chrome-molybdenum steel quenched in water from 1600 deg. F. and tempered through the range indicated.

The temperature for this draw or tempering treatment will be varied according to the physical properties required in the finished steel. The usual draw temperatures range between 900 and 1300 deg. F.

Castings of heavy section which are to be heat treated are benefited by a preliminary normalizing treatment at a temperature of 1750 to 1800 deg. F. For the usual run of castings, however, with sections not over 2 in., the necessity for this treatment is not urgent. It is impossible to place too much emphasis on the importance of good furnace equipment. Well insulated furnaces capable of uniformly heating the castings to the required temperatures spell the difference between good physical properties and unsatisfactory ones. Electric annealing and heat treating furnaces are easily controlled but just as good results can be obtained with properly designed gas or oil fired units. Automatic recording and controlling py-

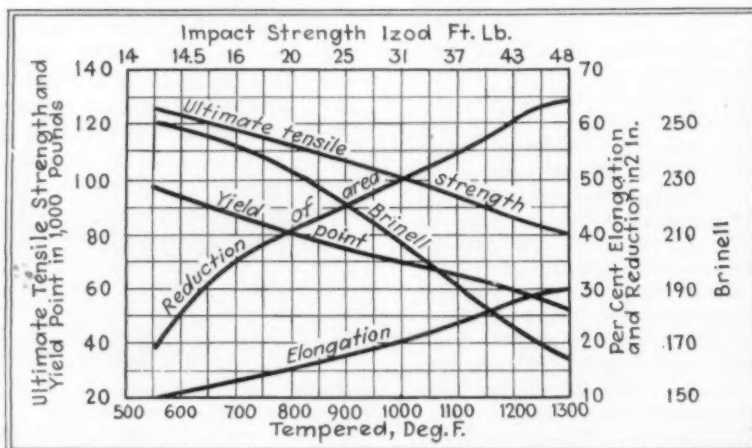


Chart No. 3—Unusual properties attained with a carbon heat-treated steel when the same carefulness is exercised that is necessary to produce the successful alloy casting.

shrinkage allowance but the majority of alloy castings will show casting shrinkage from 3/16 to 5/16 in. per foot. Design, casting temperature and condition of the sand all have a most important influence on the shrinkage allowance which will pro-

duce castings accurate to the desired dimensions. Because alloy steels have a greater shrinkage and because the steel is more "tender" and liable to crack at both elevated and ordinary temperatures, the molding and core making departments must take greater pre-

core ovens are almost a necessity, to make certain that baking is done at the proper temperatures and for the required length of time. Sand reclaiming and conditioning equipment is of the greatest value, and the sand mixtures should be made under laboratory control. Permeability,

strength and moisture content should be determined on all sand mixtures as a matter of routine.

Cleaning Department

Alloy castings will often cold crack because of internal strain, if allowed to cool in the usual manner. This is

especially true during cold weather. With castings of intricate design it is usually necessary with any alloy steel to shake out the castings at a temperature of about 1200 to 1500 deg. F., and remove them at once to an annealing furnace of about the same temperature. The castings are then thoroughly annealed with the heads and risers attached and cooled slowly in the furnace. It is advisable for extremely intricate castings to reheat them to 1100 or 1200 deg. and transfer from the furnace to the flame-cutters promptly in order to cut off the heads and gates with an oxygen acetylene torch before the castings become cool.

The carbon steel castings which may be shaken out and handled with impunity throughout the various burning, grinding, welding and chipping operations may crack into two pieces if made in an alloy steel and handled in the same fashion. Local heating not followed promptly by annealing or heat treating is especially to be avoided.

Personnel and Research

A TRAINED personnel is one of the prime requisites for the successful production of alloy steel castings. Melting and heat treating departments require technical supervision, and the entire staff requires no small amount of skill, patience and ingenuity to cope with the problems which present themselves daily.

In addition to the usual testing equipment a small melting unit capable of manufacturing 50 to 100 lb. of steel will prove a worthwhile investment. In the Bonney-Floyd foundry a 50-lb. arc furnace is kept almost continuously busy producing pilot heats and experimental compositions. Many ideas which later proved to have great practical value have been tried out in this miniature foundry.

To show the great variation in physical properties which is produced by variation of the temperatures employed in the tempering or draw treatment, charts for two alloy steels have been included. Chart No. 1 shows the properties of manganese-molybdenum steel of 0.30 per cent carbon, 1.25 per cent manganese and 0.25 per cent molybdenum contents, quenched in water from 1600 deg. F. and tempered through a range from 500 to 1300 deg. F. Chart No. 2 shows the properties of nickel-chrome-molybdenum steel of 0.30 per cent carbon, 0.80 to 0.90 per cent chrome, 2.00 per cent nickel and 0.25 per cent molybdenum, quenched in water from 1600 deg. F. and tempered through a range from 500 to 1300 deg. F.

As a matter of general interest chart No. 3 has been included showing the unusual physical properties which can be attained with 0.30 per cent carbon heat-treated steel if the same careful practice necessary for successful alloy casting production be followed.

Fifteen Classes of Alloy Steel Castings Regularly Made in United States

Physical properties are given for the steels in both the normalized and heat treated states. Figures represent the average rather than minimum, and in the majority of cases the steels are of machinable hardness.

TYPE	Analysis	Ultimate Strength, Lb. per Sq. In.	Yield Point, Lb. per Sq. In.	Elongation, per cent	Reduction of Area, per cent	Brinell No.	Isod, ft.-lb.	Treatment, Degrees F.
1. Nickel Steel	C-0.25 Ni-3.50	101,000	69,000	24.0	32.0	..	..	W. Q. 1650 T. 1250
	C-0.35 Ni-3.00	95,000	65,000	13.0	22.0	230	..	N. 1500 T. 1100
2. Chromium Steel	C-0.36 Cr-3.00	147,000	110,000	10.0	29.9	280	..	O. Q. 1650 T. 1100
	C-0.35 Cr-0.77	97,000	56,000	17.5	26.0	217	..	N. 1650 T. 1250
3. Molybdenum Steel	C-0.26 Mo-0.61	97,800	75,600	24.5	58.0	197	..	W. Q. 1600 T. 1300
	C-0.26 Mo-0.61	86,700	61,000	27.0	60.0	170	..	N. 1600 T. 1300
4. Manganese Molybdenum	C-0.30 Mn-1.20 Mo-0.20	100,000	80,000	21.0	50.0	205	52.0	W. Q. 1600 T. 1250
		84,000	60,000	27.0	55.0	165	..	N. 1600 T. 1300
5. Chrome Molybdenum	C-0.30 Cr-0.80 Mo-0.20	112,000	94,000	18.0	50.0	230	..	W. Q. 1550 T. 1250
		110,000	80,000	20.0	40.0	210	..	N. 1550 T. 1250
6. Nickel Chrome Molybdenum	C-0.30 Cr-0.80/90 Ni-2.00 Mo-0.25	115,000	92,000	20.0	50.0	230	42.0	W. Q. 1600 T. 1250
		114,000	89,000	21.0	50.0	240	..	N. 1650 T. 1200
7. Chromium Manganese Molybdenum	C-0.34 Cr-0.96 Mn-1.19 Mo-0.34	115,800	82,450	21.0	55.0	227	..	W. Q. 1600 T. 1300
		105,800	77,450	23.0	55.0	207	..	N. 1600 T. 1300
8. Nickel Molybdenum	C-0.30 Ni-1.50 Mo-0.30	90,000	60,000	22.0	45.0	..	..	N. 1600 T. 1200
	C-0.30 Cr-0.90 Ni-2.00	113,000	93,000	20.0	55.0	229	..	W. Q. 1550 T. 1250
9. Nickel Chrome		110,000	75,000	20.0	40.0	210	..	N. 1550
								Normalized and tempered. Temperatures not given.
10. Nickel Vanadium	C-0.20-0.30 Ni-1.50-1.75 Va-0.12-0.15	85,000 to 95,000	55,000 to 65,000	22.0 to 25.0	45.0 to 50.0	.. to ..	.. to ..	
11. Nickel Chromium Manganese Molybdenum	C-0.35 Ni-1.50 Mn-1.25 Cr-0.90 Mo-0.30	138,000	118,900	16.0	45.0	302	..	N. 1650 T. 1100
12. Chrome Vanadium	C-0.30 Cr-1.00 V-0.10	94,300	64,800	27.5	57.0	..	50	O. Q. 1600 T. 1300
								Double normalized and tempered. Temperatures not given.
13. Manganese Vanadium	C-0.35 Mn-1.40 V-0.10	104,000	79,000	27.0	54.0	..	49	
14. Nickel Manganese	C-0.30 Mn-1.44 Ni-2.30	114,000	64,000	15.7	25.5	..	..	W. Q. 1650 T. 1250
	C-0.30 Mn-1.10 Ni-1.00	85,000 to 105,000	55,000 to 65,000	22.0 to 25.0	45.0 to 50.0	175 to 185	40.0 to 45.0	N. 1650 T. 1200
15. Pearlitic	C-0.35 Mn-1.25	85,000 to 100,000	50,000 to 60,000	18.0 to 22.0	40.0 to 50.0	160 to 200	15.0 to 25.0	Normalized temperatures not given.

W. Q. = Water Quenched; O. Q. = Oil Quenched; T. = Tempered; N. = Normalized. Steels Nos. 3, 4, 5, 6, 7, and 9 manufactured by Bonney-Floyd Co.

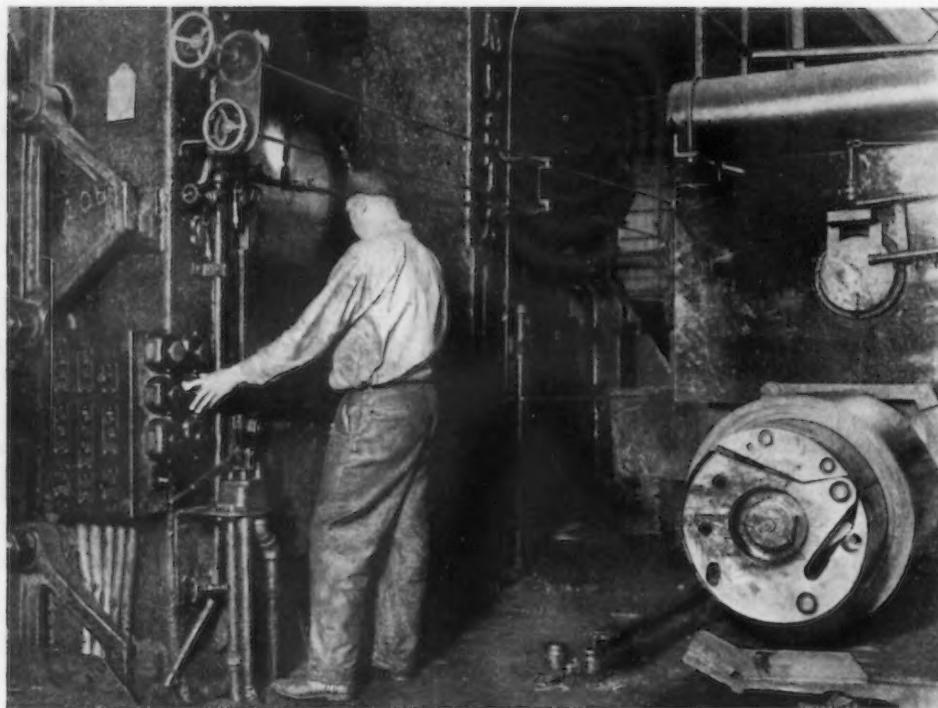


Fig. 1—Last stand and reel of 54-in. tandem mill of Inland Steel Co. at Indiana Harbor, Ind. ▲ ▲ ▲

Tension Reels for Strip Mills

TENSION reels are used principally with cold strip mills for winding up the finished strip into tight coils. Such reels consist essentially of motor-driven, collapsible drums equipped with jaws for clamping the end of the strip.

Tension is essential to obtaining a flat, smooth strip with a high finish. Furthermore, as the art of cold rolling has progressed the amount of tension used has been gradually increased until it has become an appreciable part of the rolling power, or, in other words, until it is great enough to cause some reduction in the metal. Thus, in addition to affecting the quality and finish, variations in tension may cause variation in gage accuracy. Therefore, the maintenance of constant tension at all times is of greatest importance to insure a minimum amount of scrap, and thereby a minimum cost of production.

A great deal has been published regarding the mechanical details of various types of reels and specific types of control. This article will, therefore, be limited to a discussion of the general control requirements and the principles involved in maintaining constant tension. A description of actual equipment will only be used as a matter of illustration.

What Maintaining Tension Entails

With this in mind, the refinements of the control and tension maintenance for the application which is probably the most difficult—the automatic collapsible reel winding up wide, thin strip such as tin plate stock—will be discussed. Naturally all of these re-

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finements are not required for all types of reels and all applications, but the elimination of the unnecessary ones is comparatively simple once they are understood.

Although there are many slight variations in the actual mechanics of automatic collapsible reels, essentially they are alike. The drum is connected to its shaft through toggles in such a manner that when the shaft is rotated by the reel motor and the drum is restrained, the drum will expand and the jaws will clamp. A foot operated band brake is normally used for obtaining this restraining force, until the strip is taut and supplies this force itself, although this operation might be obtained automatically by using a solenoid or a Thrustor. As soon as the coil is completed and the end of the strip leaves the mill, the restraining force is lost and the reel collapses.

In applying electric drive and control this detail of reel design may easily be overlooked and may lead to trouble. If tension is lost, even for an instant, the reel will collapse and when the tension returns, the coil will be pulled tight on the collapsed drum, causing scratching and wrinkling. Furthermore, the coil can not be removed unless the reel is reversed, and the coil is unwound sufficiently to loosen it from the drum. This means loss of time and increased scrap.

The foot pedal which applies the band brake is usually arranged so that it closes the starting control switch for the reel motor. Thus the operator applies the band brake and starts the reel by the same operation.

The starting control equipment (Fig. 2) for the reel motor is essentially the same as that used for any adjustable speed d-c. motor, and will not be described in detail. There are some special features, however, which require some discussion. The control should be so arranged that the reel will accelerate rapidly to a higher speed than that corresponding to the delivery speed of the mill, enabling the slack incident to threading the reel to be taken up quickly. In fact, if more than one turn accumulates on the reel before the strip is under tension, slipping may cause wrinkles which will carry up through a considerable portion of the coil, thereby increasing the scrap. For this reason, and also to assist the operator in entering the strip squarely into the jaws, it is usually necessary to reduce the delivery speed of the mill for the threading operation.

Since the reel must accelerate to a high speed for taking up slack, means must be provided for slowing it down momentarily just as the strip becomes taut to prevent snap and possible breakage. As soon as the strip is taut, the tension control takes charge.

As the tail end of the strip leaves the mill the reel should be decelerated to a very slow or "creeping" speed, and allowed to rotate until the end is in the proper position for tying. This method saves the time ordinarily used

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FULLY as important as the mechanisms which have made for success in the tension cold rolling of strip steel are the features which have been evolved for the maintenance of the tension. These require a strictly constant pull through the mill and therefore a close regulation without fluctuations of the power end. They must compensate for changes in the diameter of the collecting reel, as the material is piled upon it; they have to provide for tension maintenance during periods of starting and stopping; they must accommodate the rolling speeds for different gages being rolled, and the like. The notably interesting mechanical details that have been developed have already been described in these columns, and now is given an opportunity to elucidate what the electrical engineer has achieved to meet the needs of the power end of the problem.

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in stopping and restarting for positioning the end of the piece and also prevents the end from whipping about.

In case of emergency, such as a man becoming caught on the strip, the reel must be stopped as quickly as possible, making both dynamic and solenoid braking essential.

Maintaining Tension Mechanically

So much for the general. The constant tension regulator, and its refinements, since its proper operation is very important, will bear considerably more detailed study.

If the strip issues from the mill at a constant speed it is evident that the reel must be slowed down at exactly the same rate as the coil diameter increases in order to maintain constant tension. This is the function of the tension regulator.

It is axiomatic that a constant tension regulator must operate as a function of the tension itself. There are only two possible methods of obtaining this measure of the tension—mechanically or electrically.

In order to utilize a mechanical measurement, some weighing mechanism involving an idler roll over which the strip passes must be used. If high tensions are to be obtained the weighing mechanism must be of heavy construction, and this means inertia. Inertia is the enemy of all regulating schemes. Furthermore, a change in angle between the pass line of the strip and the vertical force on the weighing mechanism, either from coil build-up or from movement of the idler rolls, causes inaccuracies in the measurements obtained.

The variation in the downward force on the weighing mechanism caused by changing this angle is shown in Fig. 3. In order to eliminate inaccuracy due to coil build-up an additional idler roll must be used, as shown dotted, and to minimize the inaccuracy due to movement of the idler roll, the strip must pass almost vertically downward. This whole mechanism not only becomes somewhat of a nuisance, because of added difficulty in threading, but it is difficult to eliminate inaccuracies

due to variable friction, and the mechanism is quite expensive.

Various modifications have been considered, such as allowing the whole reel drum to move, but all are fraught with mechanical difficulties or nuisance factors. In spite of all the difficulties involved in such a regulator scheme, however, one occasion arose when it was necessary, and although it was a difficult and expensive job, it must be said that the results obtained were quite satisfactory. At present, however, its limited use does not warrant description.

Thus constant tension regulators

are practically limited to those utilizing an electrical measurement of the tension. This narrows down immediately to a measurement of volts across the armature of the reel motor and the amperes in the armature circuit, the product of which represents the input to the motor. The total input to the motor does not represent the tension put into the strip—it represents: losses in the motor; losses in friction of the reel bearings, gearing, etc.; and tension in the strip. However, the losses, for all practical purposes, may be considered constant during the winding of a coil, and if we maintain constant horsepower input we will maintain constant horsepower output.

Does this mean constant tension? It may be looked at in two different ways. First, if constant tension is to be maintained during the coil build-up, it is obvious that the torque at the reel shaft must increase in proportion to the reel diameter—which, with proportional decrease in speed, means constant horsepower output. Second, it is fundamental that:

$$\text{Horsepower} = \frac{\text{Feet per minute of strip} \times \text{pounds tension}}{33,000}$$

$$\text{Horsepower} = \frac{\text{Volts} \times \text{amperes}}{746} \quad (\text{neglecting losses})$$

Now, if the strip speed is constant and the horsepower is maintained con-

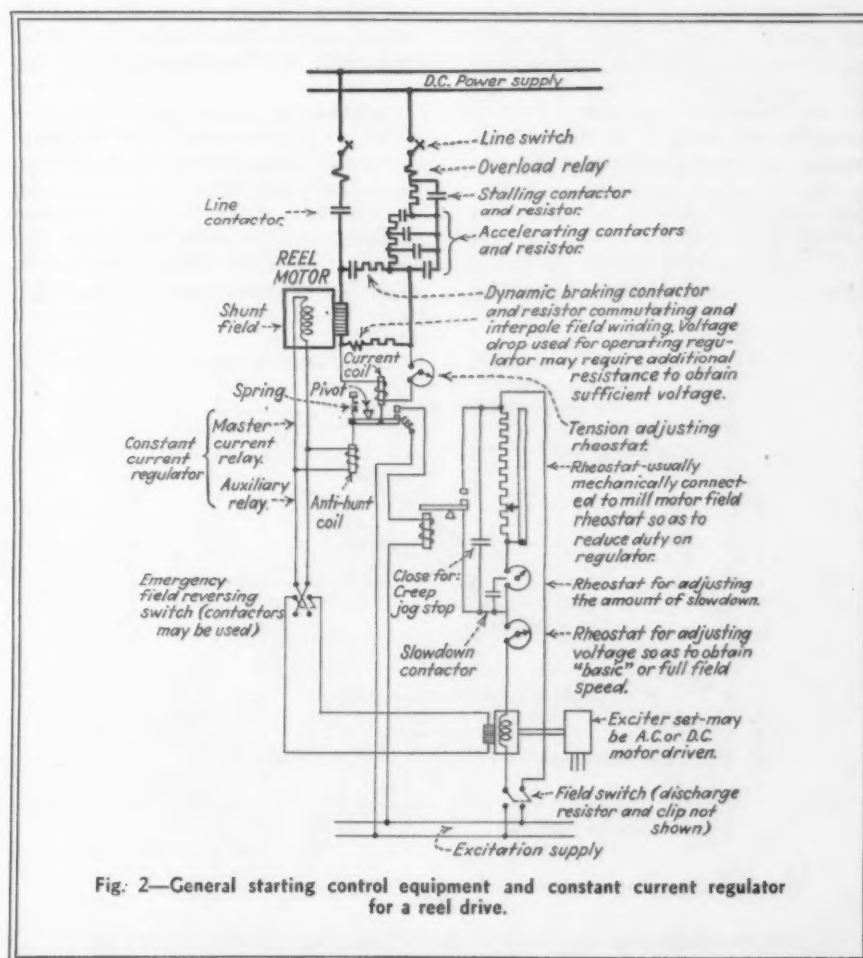


Fig. 2—General starting control equipment and constant current regulator for a reel drive.

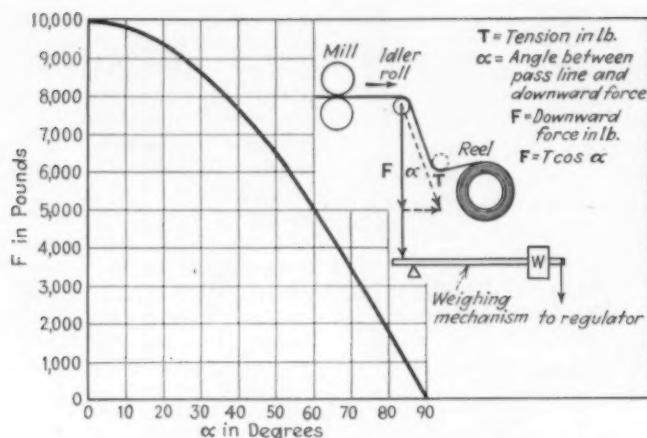


Fig. 3—Variation in indicated tension with variations in angle between pass line of strip and the downward (vertical component) force.

stant, it is evident that the tension will remain constant.

The most convenient and economical method of obtaining constant horsepower over the speed range necessary for the coil build-up is by motor field control. Pursuing the above formula further, it is evident that if a regulator is used which maintains constant current in the armature circuit by controlling the field of the motor, constant tension will result—assuming, of course, a constant strip speed and a constant voltage being applied to the armature.

Fundamentally, all constant tension regulators, based upon electrical measurement of tension, operate on this same principle—if the armature current increases, the motor field is strengthened; and, if the current decreases, the motor field is weakened. In the practical application of this basic scheme, however, a variety of combinations of different devices have been used—current relays operating rheostats; torque motors operating

rheostats; current relays operating high speed contactors, which intermittently short circuit and insert resistance in the reel motor field; current relays operating fast relays which in turn control the field of an exciter and thereby the reel motor field, and so on.

Avoidance of So-called Hunting Essential

In examining any particular scheme, what details must be looked for? There are several very important considerations: speed of operation ("anti-hunting" features), tension during acceleration, forcing during acceleration, tension during deceleration, tension at standstill, and maintenance of the equipment.

Offhand, it might seem that the speed of operation would not be a matter of importance since the growth of the reel is rather slow. This, however, is somewhat misleading. As a matter of illustration, consider probably the simplest regulator scheme—a current relay and a motor operated rheostat.

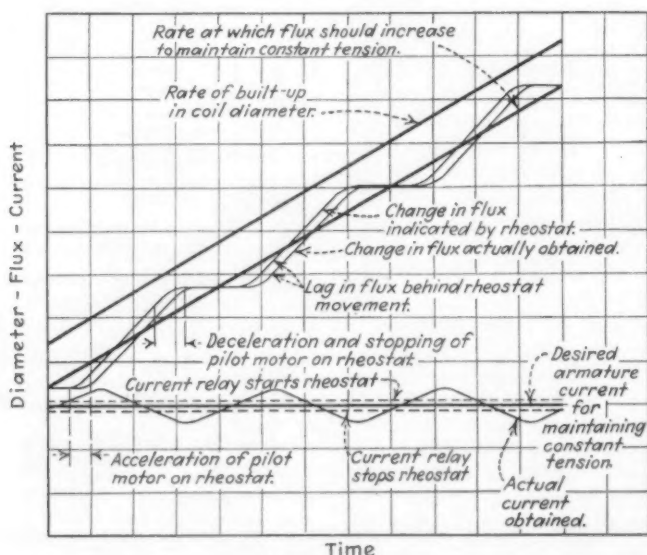


Fig. 4—Exaggerated "overshooting" due to a sluggish regulator. (Based on a current relay operating a motor operated rheostat.)

There are very definite physical limitations in regard to its maximum possible speed of operation, and it can be considered "slow" as compared to a vibrating relay.

It must be borne in mind that the rheostat has a fixed speed of operation and that the field flux of the reel motor must change at exactly the same rate as the diameter of the coil increases. But, the rate of coil build-up is not fixed, it varies according to the strip speed and the thickness of the various finished products. Thus, the rheostat must be "notched" up in "infinitely" small increments in order to obtain the same rate of rheostat travel or field charge as the rate of build-up.

We have recognized, however, that the rheostat is slow and that it is physically impossible to start and stop it "infinitely" quickly. Furthermore, the field of the reel motor inherently lags behind the value indicated, by the position of the rheostat. This means that when the rheostat "notches" up, it goes too far and overcorrects which, in turn, means the current falls below the value to be held and the current relay tries to back up the rheostat. This causes overshooting or "hunting" and corresponding fluctuations in tension. Fig. 4 shows an exaggerated graphical illustration of this overshooting and its effect.

Solution Lies in Vibrating Contacts

If the rheostat is replaced by vibrating contacts operating across resistance in the reel motor field circuit directly or indirectly through an exciter, the parallel in operation is immediately recognized. The vibrating contacts are in reality a relay or a magnetically operated contactor which has a fixed rate of opening and closing. It is evident that with such a device the actual field current—and thereby speed and armature current, or tension—is proportional to the ratio of the "time closed" to the "time open" of the contacts.

Unlike the rheostat, however, a small regulating relay can be made to operate very quickly; in fact, it can be made to follow a 25-cycle alternating current wave. This means that the current handling capacity of the contacts is low, and either a number of them, depending upon the size of motor and range of control, must be used, or an exciter must be allowed to handle the motor field, and the regulator, in turn, the field of the exciter. This choice is a question of maintenance. Regulator contacts are expensive and troublesome to replace. It might be mentioned that the severity of the duty on a regulator contact is not solely a question of current it must handle, but of the voltage as well.

Every system of regulation must be examined for sluggish components, if overshooting, of the same nature as that just described, with its corresponding variations in tension, is to

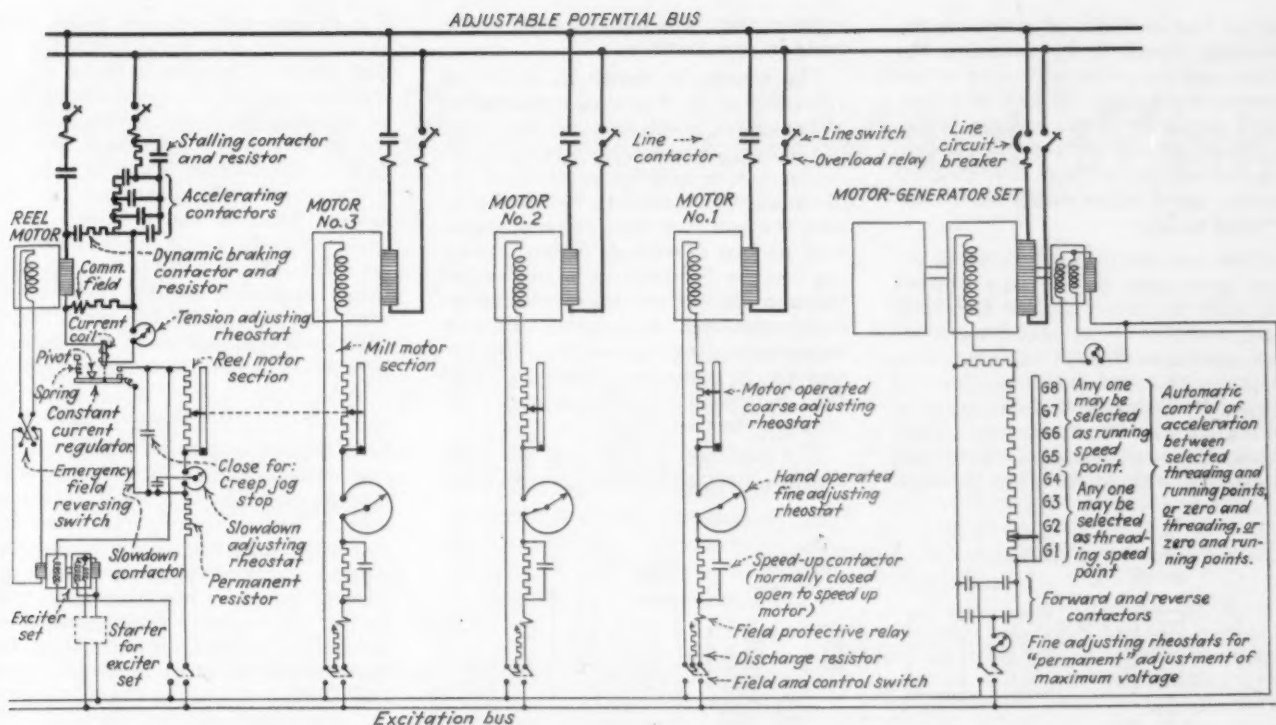


Fig. 5—Elementary diagram showing main connections for an adjustable potential cold strip mill control with tension reel.

be avoided. One point requires special consideration. If there is any component, such as a large rheostat or contactor which requires considerable power for its operation, and accuracy is desired, this power should not be derived directly from the armature current which is to be maintained. The very fact that the device requires considerable power means that the armature current, and thereby the tension, must vary appreciably to perform the operation. It is best to use an actuating device which will operate on small variations and then allow this device to apply power from an outside source to the device requiring the power.

Covering Acceleration Period Highly Important

It has been mentioned previously that it is often necessary to reduce the mill speed for threading. This is almost invariably true when rolling tin plate, and the like. In fact in "skin" or "finish" rolling on single stands for this class of work the mill is usually stopped when enough strip has been run through to reach the reel. The reel is then threaded and allowed to "stall" with tension on the strip. In either of the above cases, however, the mill and reel are accelerated up to the running speed with the strip under tension.

Now, if the regulator maintains constant current, it is necessary that the voltage applied to the reel be increased exactly in proportion to the increase in strip speed. This would give constant tension if it were not for the fact that a certain amount of the input current is required to accelerate the reel and the motor. The tension

actually held is, therefore, decreased by the amount of current required to accelerate the motor. Thus, in order to hold constant tension during this period, it is necessary to set the regulator to hold a higher current, termed "forcing," depending upon the rate of acceleration and the inertia or WR^2 of the mass to be accelerated.

For all practical purposes the inertia load can be considered constant, but the rate of acceleration depends upon that of the mill. If the rate of acceleration varies, the "forcing" on the reel must vary accordingly, if absolutely constant tension is to result.

Usually it is sufficient to obtain as uniform a rate of acceleration on the mill as possible, and "force" a definite and constant amount during the period

of acceleration. It is obvious that here, if at no other place, the regulator must be "fast" and there must be accurate control of overshooting—"anti-hunting." This "forcing" and maintenance of approximately constant tension during acceleration can not be over-emphasized, especially when considering the rolling of thin strip, for without it gage is not maintained and scrap is increased.

Controlling the Strip Speed

Now, a word about the application of voltage to the reel, proportional to the strip speed, when accelerating from the threading speed or from standstill.

On a tandem mill, rolling tin plate and the like, the usual—and incident-

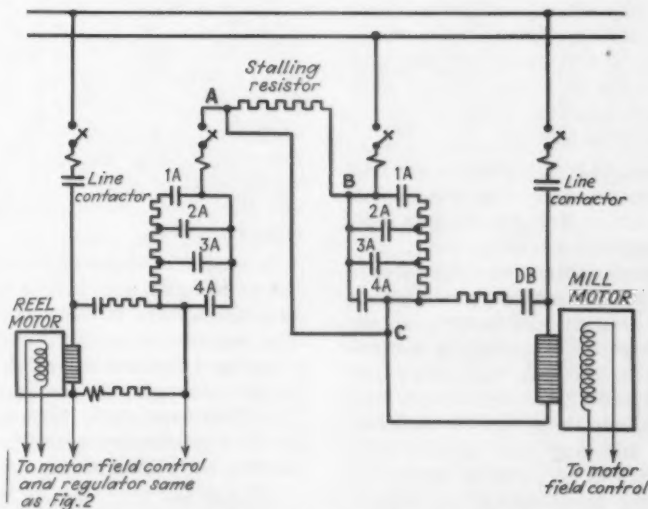


Fig. 6—Parallel acceleration of reel and mill motors for operation from a constant voltage supply.

ally the best method—of obtaining the threading speed is by reducing the voltage applied to the mill motor armatures by weakening the field of a generator supplying power to them. (Fig. 5.) Thus all mill motors are reduced in speed together without changing the relative speed adjustments of the individual motors.

If the reel motor is connected to the same generator, the voltage applied will vary in proportion to the strip speed, and there is no need for a separate generator. Furthermore, with this type of control, the mill can be stopped by reducing the voltage to a value determined by the residual magnetism of the generator, and the reel allowed to stall on this low voltage.

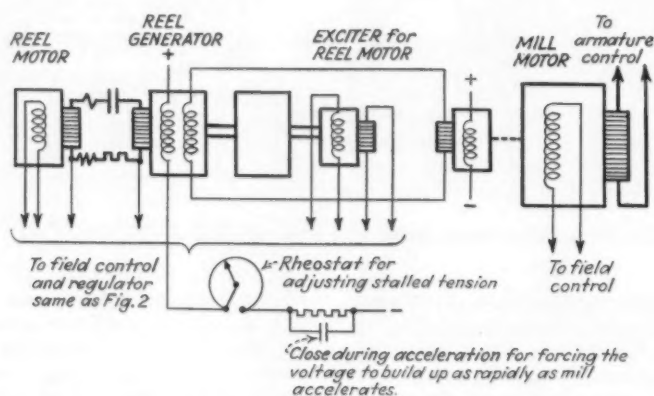


Fig. 7—Tension reel control utilizing a separate generator for the reel.

In order to control the amount of "stalled" tension, a "stalling" resistor can be inserted in the reel armature circuit. It will be noted that with this scheme there is no transfer to a separate source of power for obtaining the "stalled" tension, and there is no possibility of losing tension for even an instant.

"Skin" pass mills usually consist of a single stand and, due to the expense of a separate generator, they are generally supplied from a constant voltage bus, and employ ordinary rheostatic starting control equipment. This control, however, should have more than the usual number of accelerating steps in order to obtain smooth and uniform acceleration, which is essential for uniform tension.

The application of voltage to the reel motor here presents somewhat of a different picture from the tandem mill. Various methods could be used, with varying success, such as using a separate generator for the reel, whose voltage is proportional to strip speed, or operating the accelerating contactors for the mill and reel simultaneously. One of the most direct and simple methods, however, is to accelerate the mill and reel motors with their armatures in parallel controlled by the same accelerating contactors. Thus exactly the same voltage is applied to both armatures at exactly the

same instant, and the two must accelerate in synchronism.

The scheme is shown in simplified form in Fig. 6. From an examination of the sketch it will be noted that none of the flexibility of control is sacrificed—the motors may be accelerated individually for threading "on the fly"—with the mill running—or from standstill, as just described. When threading "on the fly" the mill is accelerated through its own control by closing its line contactor and contactor 1A, then the accelerating contactors, 2A, 3A, and 4A, in sequence. When 4A closes full potential is obtained at "A" through the connection C-A.

The reel may then be started, when desired, through its own control. When

threading from "standstill," the mill is started, enough strip run through to reach the reel, and then stopped—line contactor, 1A, 2A, 3A and 4A opened. The piece is entered into the reel jaws and the reel started through its own control—note, however, that since the mill motor accelerating contactor is open, the reel motor can not obtain power through connection A-C, but must obtain it through "stalling" resistor A-B, which has enough resistance to limit the "stalled" motor current to a safe value.

The reel motor is, therefore, allowed to stall with its line and accelerating contactors closed. Now when the line contactor for the mill motor is closed, it will be noted that its armature will be placed in parallel with that of the reel motor. The two motors are then accelerated in parallel by the closing of the mill motor contactors in sequence.

In case it is necessary to stop during the winding of a coil, it is only necessary to open the mill motor contactors. The reel motor contactors are all left closed and the reel will stall, obtaining power through its stalling resistor. Note that here again there is no transfer to any other power circuit for obtaining the stalled tension.

So far we have considered only a constant speed mill. If the mill is driven by adjustable speed d-c. motors,

it is obvious that the reel motor must have an increased speed range beyond that required for the build-up of the coil. This part of the speed range could be obtained by voltage, but this requires a separate generator for the reel. In most cases, it can be obtained by increased field control of the reel motor. Thus, if the mill has a 2:1 speed range by motor field control and the coil build-up range is 2:1, the total range required for the reel motor would be 4:1 by field control. Some additional speed range by field control is required as margin on the regulator.

Many reel motors have been installed having 5:1 speed range. However, beyond this point it may become less expensive and better operation may be obtained if a separate generator is used (Fig. 7). In observing this sketch, it will be noted that by using a pilot exciter, the voltage applied to the reel is always proportional to the strip speed. Here again, when the mill is stopped during rolling, the reel is left connected to its generator and allowed to stall on the voltage due to the residual magnetism. The amount of stalled tension can be readily adjusted by the addition of a separately excited auxiliary field, which can also be used for "forcing." This "forcing" is quite important because the voltage of the reel generator tends to lag behind the mill motor speed during acceleration.

From our previous discussion it is clear that the input to the reel motor must be increased as the strip speed is increased. This can be done either by increasing the voltage, if a separate generator is used, or by increasing the value of armature current which the regulator holds—if a separate generator is not used. This increase of current can be adjusted by hand with the tension adjusting rheostat, or automatically. As a rule it is not necessary to make this feature automatic, because one speed is usually found most satisfactory for a particular rolling schedule and it is seldom changed during rolling.

AS a rust preventive the efficacy of red lead is indicated by the example of the steel bridge across the Rhine near Cologne. The bridge members were recently found to be in perfect condition after 50 years of exposure. According to Manfred Ragg, consulting engineer, New Wentorf, bei Hamburg, Germany, in a paper before the international corrosion conference held in Chicago Sept. 7 under the auspices of the Electrochemical Society, the corrosion-resistant behavior of steel surfaces when painted with red lead depends in part upon the formation of nearly insoluble complex glycerates and basic lead soaps which cement the pigment particles together, strengthen the paint film and make it watertight.

Protective Painting of Metal Work

PROTECTIVE painting of metal surfaces was discussed at length by S. C. Britton, student, and Dr. U. R. Evans, lecturer, Cambridge University, England, at the September meeting in Chicago of the Electrochemical Society. Their paper in large part was as follows:

Two Coats of Different Properties

The most successful painting methods, while aiming at a reasonably waterproof covering, usually depend also upon the presence, in the lowest coat, of some substance which chemically inhibits the corrosion reactions. In general, the lowest coat should be chosen for its chemical properties and the upper coat for its mechanical properties. The well-known combination of red lead in the lowest coat and iron oxide in the upper coats provides an illustration; red lead has excellent rust-inhibitive properties, but its mechanical characteristics are poor; iron oxide is (in most varieties) inert chemically, but yields coats which are mechanically much better.

The slow wastage of paint on suitably painted metal work is doubtless due to outside influences, such as chemical changes in the vehicle due to light, mechanical abrasion by wind-blown dust particles and possibly even dissolution of the vehicle by rain. But exceptional cases of rapid failure, where the paint is locally pushed away from the metal, often arise from rusting below the paint. Rust is a secondary product, a precipitate formed from the more soluble primary products in presence of excess oxygen. On painted iron work immersed in water, rust usually forms outside the paint, which may remain firm even when deeply covered with rust. But for painted metal exposed to the atmosphere, there is more oxygen at hand, and rust may often be precipitated below the paint.

The true sequence of events is sometimes concealed by the fact that some externally applied stress may first cause the failure to become conspicuous. It is, for instance, often stated that frost causes paint failure. Frost is the occasion, rather than the cause, of paint failure.

The life of painted metal work may be said to depend on four variables:

1. Nature of the metal.
2. Presence of separating matter between metal and paint, such as (a) mill-scale, (b) rust, (c) water, or (d) salt.
3. Character of the paint, as determined by the nature and quantity of its com-

IN paints for protecting metal surfaces against corrosion the variables that have to be taken into consideration include the character of the metal itself, what kind of a scale is adhering to it, whether there is already some surface rust, whether there is a moisture film covering it or the atmosphere has salt in solution. The authors review briefly the paint elements of pigment, oil, thinner and drier.



ponents, notably (a) the pigment, (b) the oil, (c) the thinner, and (d) the drier.

4. Character of the atmosphere, water or soil, to which the painted metal is exposed.

A summary of the effects of the four variables mentioned above, as shown by the results of the authors' private tests to date, is as follows:

Effect of Metal on Life of Painted Work

The results, so far as they go, serve to bear out the superiority of copper steel over ordinary steel, which has been indicated by more elaborate tests in Germany and America. They also point to the good behavior of wrought iron. This is apparently due to the infrequency of specially susceptible points, the greater tendency to passivity and the convenient character of the scale. Actually there are two scales on wrought iron; one comes off very easily, while the other is so adherent that paint can be applied over it without causing any of the undesirable effects often met with when paint is applied to steel without previous descaling.

A comparison between pure electrolytic iron and high-quality steel, supplied as thin sheet by Dr. W. H. Hatfield, gave interesting results. When tested in the unpainted condition, the steel developed much more rust than the electrolytic iron during the first few days, but afterward both

materials became thickly coated with rust.

When these same two materials were exposed in the painted condition, no genuine advantage was discovered for the pure material. Below a poor paint, rust appeared rather quicker on steel than on pure iron, but neither material resisted long under coats of this character. Below a good coat of paint, each material showed excellent behavior.

After 2½ years outdoor exposure to the Cambridge atmosphere, specimens of each material covered with a single coat of either red lead or iron oxide paint showed only trivial attack below the paint, although in this period the unpainted strips at the top had actually suffered perforation through their thickness of 0.34 mm. (0.0134 in.) This appears to show that there is no need to reduce the carbon or manganese content of steel, in order to obtain permanence, provided that the paint is compounded on scientific principles. But it does not mean that all steels would fare equally well; there is considerable evidence that physical unsoundness and high sulphur content cause premature failure, and it is doubtful whether painting would prevent this.

Mill Scale Between Metal and Paint

The effect of mill scale on the good behavior of paint varies enormously with the type of scale. The lower scale on wrought iron can often be left in position without serious effects. The mill scale on steel varies very much according to the rolling conditions. In general, in the authors' tests, descaled steel covered with a good paint has begun to show rust stains sooner than corresponding specimens painted over the scale, but the paint, although rust stained, has usually remained firmly attached, so that fresh coats can be applied without ill effects.

On the scale-bearing specimens, however, attack has sooner or later commenced at cut edges or at breaks in the scale, and this attack has then proceeded sideways just below the scale, undermining it and causing scale and paint to flake off together; in such a state, repainting without thorough scraping is quite useless. Conceivably, if the scale were originally quite perfect over the whole surface to be painted, it would do no harm and probably aid the protection;

(Concluded on Page 68)

Life of Turning Tools as Influenced by

By O. W. BOSTON

Director of the Department
of Engineering Shops
University of Michigan

and

W. W. GILBERT

Research Fellow
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IN studying the influence of the side-cutting angle, tools were ground with side-cutting angles of 0, 30, 45, and 60 deg., respectively, with all other angles constant, such as back rake 8 deg., side rake 14 deg., end and side clearance 6 deg., end cutting 6 deg., and nose radius 3/64 in. The experimental data for these four sets of tools are shown plotted on log-log paper in Fig. 6. Four straight lines are shown with their respective equations and constants. The exponents n for the 30, 45, and 60-deg. tools are practically identical at 1/9, while the exponent n for the 0-deg. side-cutting angle tool is 1/11.9. It is seen further that the constants for those tools having the greatest side-cutting angle are greatest.

A relation between the side-cutting angle and the cutting speed for several specific values of tool life is shown in Fig. 7. For a 60-min. tool life, the cutting speeds for 0, 30, 45, and 60-deg. side-cutting angle tools are 107, 137, 149, and 158, respectively. Expressed in relative values, these speeds become 1.00, 1.28, 1.39, and 1.48, respectively.

Allowable cutting speeds for 10, 20, 60, and 90-min. tool life also are shown for the various side-cutting angles in Fig. 7.

The effect of changing the side-cutting angle on the cutting speed when the depth of cut and feed are constant may be represented by the following equation,

$$\frac{V}{(a + 15^\circ)^{1/9.1}} = C$$

in which a is the side-cutting angle in degrees and C , a constant, is a function of the tool life. This equation is developed from the four parallel lines expressing a relation between the cutting speed as ordinates and side-cutting angles as abscissas, as shown in Fig. 8.

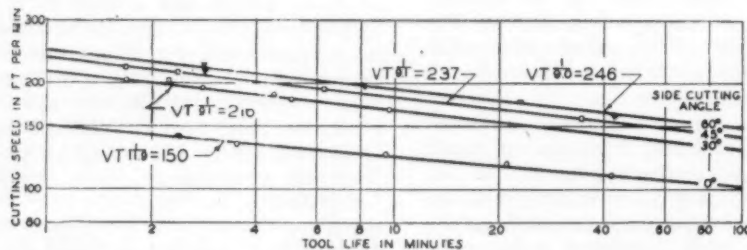
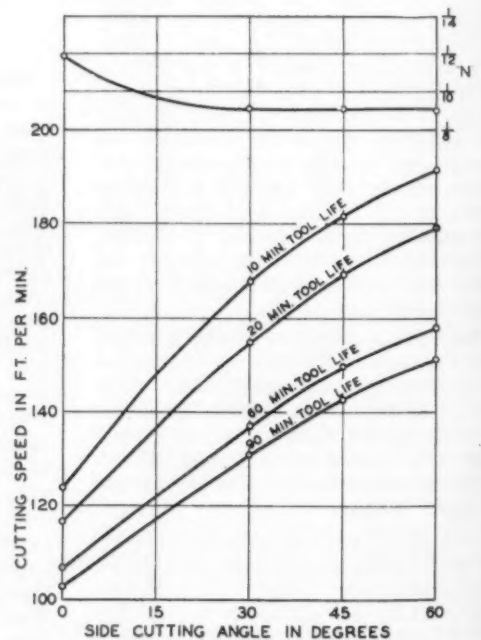


FIG. 6 (below) — Effect of side-cutting angle on tool life and cutting speed when using 8-14-6 variable side-cutting angle 3/64-in. R high-speed steel lathe tool.

FIG. 7 (at right) — The effect of varying side-cutting angle on the performance of a high-speed steel lathe tool, 8-14-6 variable side-cutting angle 3/64-in. R.



1/10.7, rather than 1/9.1 which obtained for the balance of the tools.

The quality of the finish was not noticeably affected by a change in the side-cutting angle, except where chatter occurred with the side-cutting angles of 45 deg. or more, in which case a corrugated surface resulted. For the 45-deg. tool, chattering was great enough to be objectionable. For the 60-deg. tool, chatter was intense and formed saw-edged chips.

In summarizing the influence of the side-cutting angle, the following points were noted. By increasing the value of side-cutting angle, an increase in cutting speed for a 20-min. tool life is obtained for the 0, 30, 45, and 60-deg. side-cutting angles in proportion to 1, 1.33, 1.45, and 1.54. This corresponds to the relative values of tool life for a cutting speed of 117 ft. per min., which gives a tool life of 20 min. to the 0-deg. side-cutting angle tool, of 1, 13, 28, and 48. The value of the exponent n is 1/9.1 for the tools with side-cutting angles of 30, 45, and 60 deg., but is decreased to 1/11.9 for the 0-deg. side-cutting angle tool, as shown in Fig. 7.

In determining the influence of the side-rake angle, a series of tools hav-

by Shape

ing a back-rake angle of 8 deg., an end-cutting angle of 6 deg., side and end-clearance angles of 6 deg., side-cutting angle of 0-deg., and a nose radius of 3/64 in., were ground successively with 0, 6, 14, 22, and 30-deg. side-rake angles. Tests were run with each group separately. The depth of cut was 0.100 in., the feed was 0.0125 in., and the cutting was done dry.

The data resulting from these tests are shown plotted on log-log paper in Fig. 9. Five straight lines are obtained, one for each set of tools of a given side-rake angle. The cutting-speed tool-life equation for each series of tools is indicated and the values of n and C are given. It is seen that the value of n is not constant for all groups of tools. The value of n for the 0-deg. side-rake angle is 1/10. This value decreases to 1/15.3 for the 30-deg. side-rake angle, as shown also by the upper curve in Fig. 10. It is fairly uniform for intermediate values of side-rake angle.

The effect of this change of n is important in deciding the best side-rake angle to be used. When a short tool life of approximately 20 min. is to be used as a basis of tool com-

parison, the side-rake angle which will give the highest cutting speed is 20 deg., as shown in Fig. 10. If a tool life up to 300 min. is desired, those tools with a side rake of from 23 to 24 deg. are shown to be superior. For general use, however, for the cutting conditions as specified in these tests, the 22-deg. side-rake angle appears most favorable.

For a 20-min. tool life, the allowable cutting speed for the various side-rake angles of 0, 6, 14, 22, and 30 deg. will be 101, 111.5, 118, 122, and 110, respectively. These cutting speeds may be represented by ratios of 1, 1.10, 1.17, 1.21, and 1.09, respectively. The values of tool life for the cutting speed which will give a 20-min. tool life for the 0-deg. side-rake tool may be expressed as 1, 3.8, 6.1, 12.0, and 3.8.

The finish left on the test log was somewhat better for the larger values of side-rake, although the variation was small. Chatter was not present in any of the tests. For side-rake angles of 0 and 6 deg., the chips were well curled as they came from the tool and broke into short lengths which were easily disposed of. When side-rake angles of 22 and 30 deg.

THE accompanying article completes the authors' investigation of the effect of tool angles on their cutting life. The initial portion of this work was presented in THE IRON AGE of Sept. 28. The value of n , in the cutting-speed tool-life equation, was found to vary from 1/9 to 1/17.8, whereas previous reports had indicated a value between 1/7 and 1/8 for somewhat heavier cuts. It was found that tool life is lengthened materially by increasing the side-cutting angle, and the cutting speed is greater for a tool with a 16-deg. back-rake angle. The report furnishes sufficient curves to enable a shop foreman to select suitable cutting tools to perform a given task in the quickest time and with the best surface finish.

were used, the chips were long and straight, and curled very little until just before tool failure. These chips were bothersome and had to be pulled away from the machine in order to make it possible to observe the cutting action of the tool.

For the 30-deg. side-rake angle tools, there was practically no cup worn in the tool face by the rubbing action of the chip, and the tool failed by the rounding off of the cutting edge.

Effect of Back-Rake Angle

Three separate sets of tools were used in studying the influence of back-rake angles. Back-rake angles of 0, 8, and 16 deg. were used successively. The constant angles of the tool were side rake 14 deg., end cutting 6 deg., front and side clearance 6 deg., side cutting 0 deg., and nose radius 3/64 in. The results of the experiments are shown plotted on log-log paper in Fig. 11.

It appears that the most important influence of the back-rake angle is to change the value of n . This rotates the curves about a point between the 4 and 12-min. tool life. The slope of the 0-deg. back-rake tool is less than that of the 8-deg. back-rake tool, but greater than that of the 16-deg. tool. Values of n as shown in Fig. 11 are

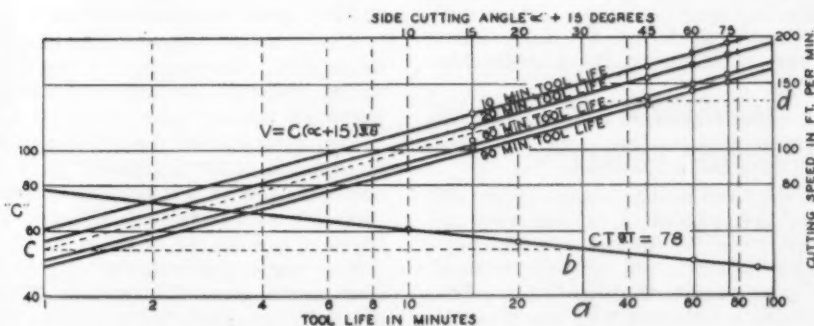
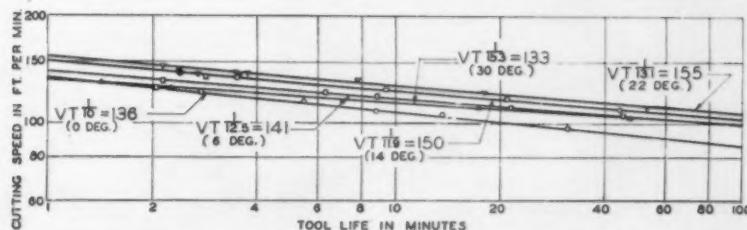


FIG. 8 (above)—Method of obtaining formula showing relation between the side-cutting angle (α), tool life, and cutting speed, when using 8-14-6 variable side-cutting angle 3/64-in. R high-speed steel lathe tool. Example: To find the cutting speed under the stated conditions for a 30-min. tool life of a 15 deg. side-cutting angle tool, follow the dashed line from a to b, c and d.

FIG. 9 (at right)—Effect of varying side-rake angle on tool life and cutting speed when using 8 variable side-rake 6-0-3/64-in. R high-speed steel lathe tool.



replotted in Fig. 12. From Fig. 11 it appears that the highest cutting speed for any tool up to 6 min. can be obtained with the 8-deg. back-rake tool. For a tool life of more than 10 min., the tool with the 16-deg. back-rake gives the greatest cutting speed for a given tool life, with the 0-deg. and 8-deg. back-rake angle tools next in order, as shown in Fig. 12. The authors have found in other similar tests using a 30-deg. side-cutting an-

dius, side-cutting angle, side-rake angle, and back-rake angle were introduced.

When the nose radius was varied from 0 to $\frac{1}{4}$ -in., the value of n in the cutting-speed tool-life equation $VT^n = C$ was found to be $1/13.1$ for the sharp-pointed tool, but about $1/11$ for all other tools, as shown in Figs. 2 and 3.

For this size of cut, the $3/16$ -in. nose radius tool chattered occasional-

cutting angle is $1/11.9$, but for the 30, 45, and 60-deg. angles it is $1/9$. See Figs. 6 and 7.

The constant in the cutting-speed tool-life equation increases as the side-cutting angle is increased. A much greater tool life is obtained for the large side-cutting angles. Chatter is apt to occur, however, for side-cutting angles greater than 45 deg. See Figs. 6 and 7.

A definite relation exists between

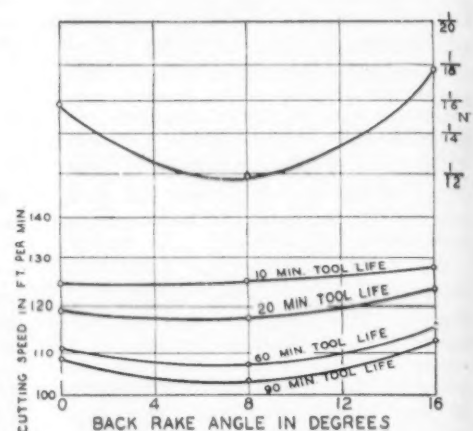
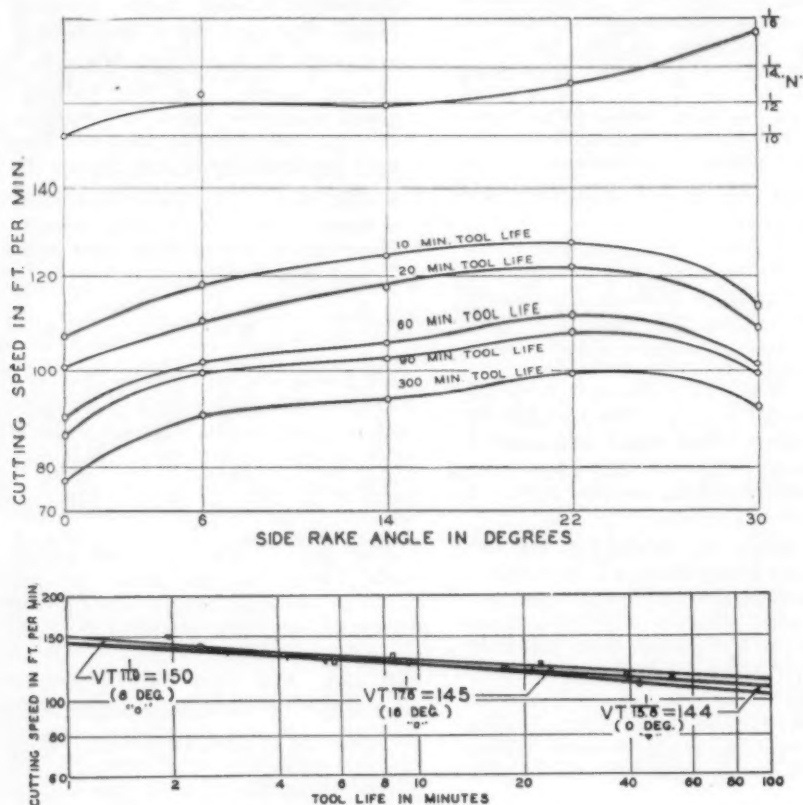


FIG. 10 (upper left)—Effect of side-rake angle on performance of high-speed steel lathe tools, 8 variable side-rake 6-0-3/64-in. R.

FIG. 11 (lower left)—Effect of back rake on performance of high-speed steel lathe tools, variable back rake 14-6-0-3/64-in. R.

FIG. 12 (above)—Effect of back-rake angle on the performance of high-speed steel tools, variable back rake 14-6-0-3/64-in. R.

gle in place of the 0-deg., that the 8-deg. back-rake angle tool shows up to best advantage for all values of tool life up to 90 min.

The finish obtained was better for the higher values of back-rake angle, but the variation was relatively small.

Two check tests were made with different basic tools and two test logs of different compositions, and in all cases the change in tool angles produced the same general change of the values of n and tool life. The results were consistent and could be reproduced at any time.

Conclusions

Running all cutting tests dry with a depth of cut of 0.100 in. and a feed of 0.0125 in. when cutting an S.A.E. 2345 steel with $3/8$ -in. square high-speed-steel tool bits of the regular 18-4-1 type, the following results were observed when variables of nose ra-

ly, but the $1/4$ -in. radius tool chattered badly. The $1/8$ -in. nose radius tool cut best considering the high value of the constant and the vibrationless cutting.

A definite relation is found to exist between nose radius, tool life, and cutting speed, as shown in Fig. 5.

With the tool life range up to 100 min., the constant C of the cutting-speed tool-life equation is approximately proportional to the value of the nose radius, that is, the greatest constant is obtained with the greatest value of nose radius. See Fig. 2.

The value of n for an 0-deg. side-

the side-cutting angle, tool life, and cutting speed, as shown in Fig. 8.

The side-rake angle influences the value of n . The value of n decreases as the side rake increases. See Figs. 9 and 10.

The constant in the cutting-speed tool-life equation increases up to a limiting value of n is obtained in these tests at approximately 8 deg. back rake. See Figs. 11 and 12.

For long tool life, the 16-deg. back-rake angle gives the greatest allowable cutting speed, but for short tool life, the 8-deg. back-rake angle is best. The 0-deg. back-rake angle is better than the 8-deg. angle for long tool life. See Fig. 11.

It has been found that the size of the cut influences the value of n . The lighter feeds give the lowest values. This is an indirect conclusion from the test run, but is believed to explain why the value of n , as determined in this report, varies from $1/9$ to $1/17.8$, while that of French and Digges¹ was $1/7$ and that of Taylor² was $1/8$ for heavier cuts with high-speed-steel tools.

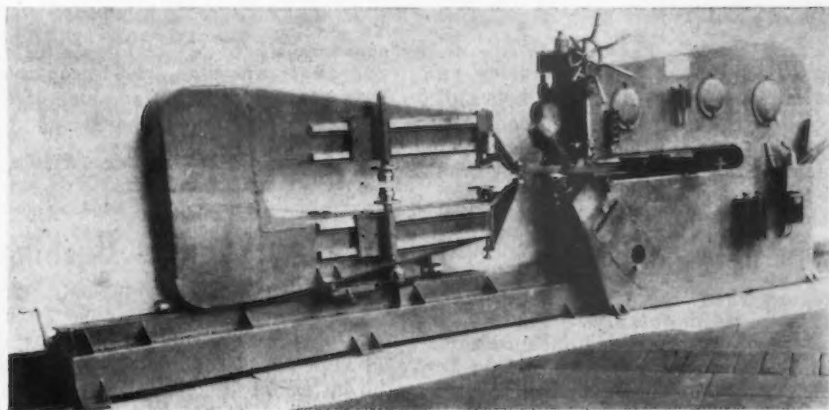
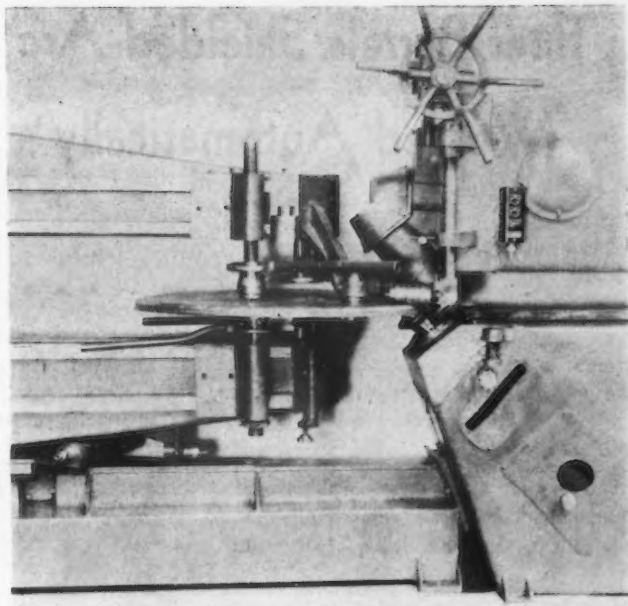


¹ H. J. French and T. G. Digges, Trans. A.S.M.E., v 48, 1926, pp 533-607, vol. 52, 1930, pp 55-86.
² F. W. Taylor, Trans. A.S.M.E., v 28, 1906, pp 31-279.

New Rotary Shear Will Cut and Flange Elliptical Heads

ELLIPTICAL as well as round heads can be cut and flanged on the new No. 230 rotary shear recently added to the line of the Quickwork Co., St. Marys, Ohio. With the elliptical attachment, round heads ranging from 12 to 84 in. can be cut from square blanks and flanged, and elliptical heads, struck from four corners and ranging in size from 42 x 34 in. to 84 x 54 in., can be cut and flanged.

▲ ▲ ▲
FLANGING of elliptical heads is shown in view at right. Arrangement of the complete machine may be seen in view below.



In addition, the machine may be used for slitting strips from 3 to 44 in. in width from the edge of wider sheets, the material being guided by a gage mounted in the throat of the shear.

The machine illustrated has capacity for shearing 5/16-in. mild steel and for flanging 1/4-in. mild steel. High-strength alloy steels, such as the new corrosion resisting materials, up to No. 10 gage can be flanged on the machine. The shear will make straight or irregular cuts, and cut square or beveled edges.

Construction features include the welded steel plate main frame and other parts, and use of geared head motors for the drive. This combination of welded steel and geared head motors is emphasized as making it possible to furnish rotary shears to meet particular requirements at a minimum cost. Thus, machines can be supplied with any depth of throat, range of speed, and any cutter or roll diameter as required; and can also be arranged with both or only one of the cutters driven, and with the cutter shaft either inclined or horizontal. Unusual strength and rigidity are claimed for the welded construction.

The standard No. 250 shear will

have metal travel speeds of 12, 24, and 36 and 72 ft. per min. Both shafts will be driven. All shafts will be mounted on anti-friction bearings and pressure lubrication provided for solid lubricant.

Introduces "Protected Arc" Welding Machine

IN addition to complete inclosure in a sheet steel cylinder, the new "Protected Arc" welder recently brought out by the USL Battery Corp., Niagara Falls, N. Y., features wide welding range, increased generator capacity, and an improved cooling system. Use of new stabilizing coils gives greater arc stability, and it is stated that strong, homogeneous welds can be produced at increased speeds, using heavily-coated electrodes.

The welding range of the 300-amp. unit illustrated is from 40 to 550 amp. Generator capacity of 40 volts permits welding with all

kinds of bare or coated electrodes without danger of overloading. Operation is simple: two convenient current and voltage controls permit any voltage and current combination desired. Convenient arrangement of current leads permits quick reversal of polarity.

Armatures of the motor, generator and exciter are mounted on a single shaft to eliminate misalignment between motor and generator, reduce friction and provide greater compactness. No resistors are used. The improved fan and ventilating system is designed to keep the welder cool even during long sustained operation.

The complete mechanism, including motor, generator, exciter, controlling devices and all wiring, is inclosed in a heavy sheet steel cylinder, which protects the machine from falling objects, moisture and dust. The entire mechanism is accessible by a hinged steel cover at the commutator end. Heavy ball bearings are used throughout the machine. The 300-amp. Protected Arc welder is 52 in. long, 24 in. wide and 36 in. high, overall, and weighs 1400 lb.



Beer Barrels Shielded-Arc Welded Automatically

THE Lincoln Electric Co., Cleveland, has developed the machine illustrated for welding both single and double-shell metal beer barrels by the shielded arc process. Equipped with the company's Electronic Tornado automatic welding head, the machine is said to produce at the rate of 30 barrels or more an hour, depending upon the type and size of barrel.

Both inner and outer shells of double-shell barrels are welded automatically. Some barrels are designed so that a single circumferential butt weld joins two half-shells to form a single piece of inner shell. Halves of the outer shell of such barrels when placed over the inner shell form two parallel circumferential joints with the inner shell. These are also welded automatically by the machine illustrated. The design of another type of beer barrel is such that two circumferential seams welded fabricate simultaneously the inner and outer shell in a single welding operation.

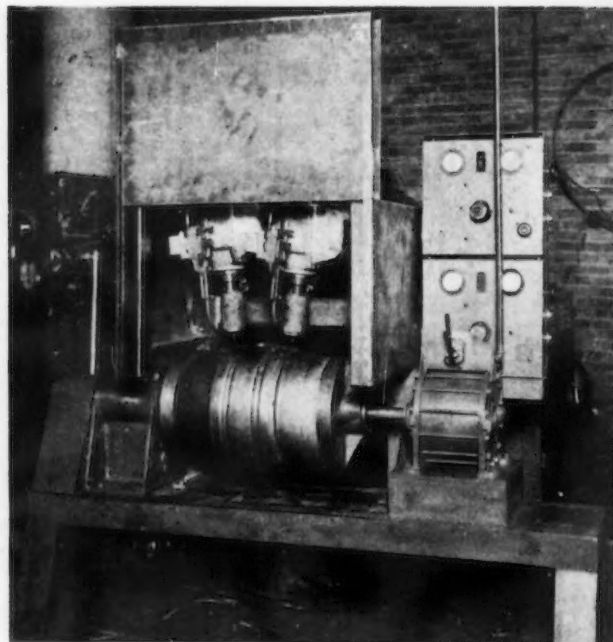
Arc-welded metal beer barrels are usually designed for either lap or butt welding. Almost always the edge forming the butt joint is coined, the resulting flange provides the necessary metal for the weld.

These welding machines are equipped with either one or two welding heads, depending upon whether the barrels have one or two circumferential seams to be welded. When two circumferential welds in the same shell are required both are made simultaneously with the automatic

▲ ▲ ▲
BOTH single and double-shell beer barrels may be shielded-arc welded. Hourly production of 30 or more barrels is obtainable.

welding heads. These heads are designed so that, though operating simultaneously within a few inches of each other, neither arc affects the operation of the other. They are stationary, the barrels being revolved automatically under the arc as the welding progresses.

Use of the shielded arc process is said to assure weld strength greater than the shell metal, and equal to it in ductility. The welds also show greater resistance to corrosion. It is stated that barrels welded by the machine illustrated have been filled with water, dropped 10 ft. and tested with air pressure, without indication of leaks. In most installations one man operates two or more machines.



conveniently by a work-train crane, and the transverse wheels, operated by a crank located on one side of the chassis, facilitate removal of the equipment from the rails.

New Graphited Bushings

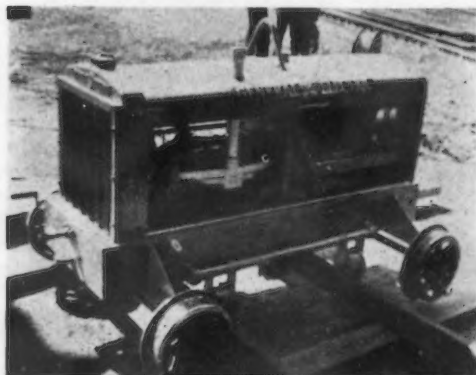
NEW graphited bushings in both cast and sheet bronze, the former for high speeds and light loads or for slow speeds and heavy loads, and the latter for less important applications, have been placed on the market by the Johnson Bronze Co., New Castle, Pa.

More than 40 per cent of the entire bearing surface of these bushings provides graphite contact with the shaft. The graphite lubricant, dovetailed into the bronze metal structure, is not soluble in water, oil or gasoline. If oil or grease is applied, it penetrates the graphite lubricant and aids in the efficiency of the bearing. Minutely spaced alternating metallic and graphited surfaces are said to produce a structure similar to that of preferred bearing alloys.

Arc Welders for Rail and Switch Maintenance

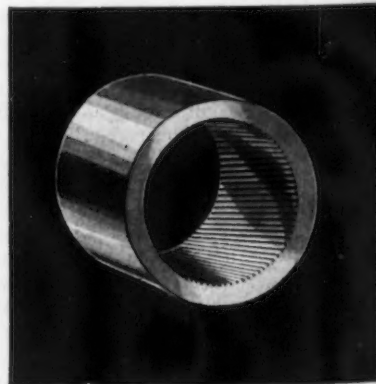
FOUR new 300-amp. engine-driven railroad-type arc welding sets for building up battered rail ends and repairing frogs and switches are being

placed in service by the New York Central Railroad. The machines were supplied by the General Electric Co. They are equipped with a lifting bail, as shown in the illustration, and are provided with a transverse wheel action. The lifting bail permits the set to be handled



▲ ▲ ▲
(At left) The transverse wheels facilitate removal of the welding set from the rails. They are operated by a crank on the chassis.

◆ ◆ ◆
(At right) More than 40 per cent of the bearing surface of these bushings provide graphite contact with the shaft.



Introduces 8-in. Fay Automatic Lathe

AN 8-in. model of its Fay automatic lathe has been added to the line of the Jones & Lamson Machine Co., Springfield, Vt., for machining such work as washing machine and refrigerator parts, valves, valve stems and bushings, the small shafts used in automobile starters and generators, and small pistons. Light finishing operations on larger work, such as automobile transmission shafts and parts may also be done economically.

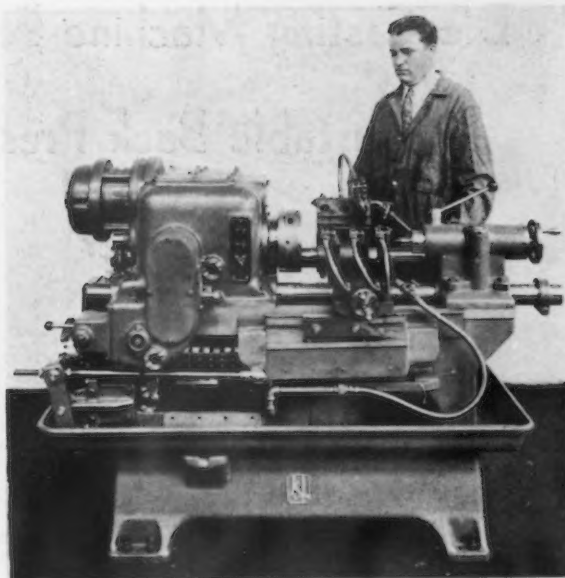
The operating cycle is entirely automatic, and the tooling possibilities are the same as in the larger Fay lathes. Multiple tooling can be arranged on the carriage to turn various diameters, straight or taper, and the back arm is arranged to face and form any number of shoulder lengths or diameters. A third cutting head, or auxiliary attachment, can be installed for turning or facing.

The headstock is equipped with a 5-hp. built-in motor controlled by push buttons on a panel at the front of the machine. Control equipment includes a switch by means of which the spindle may be jogged with the starting button. A solenoid brake is provided for stopping the machine. The spindle has a 1½-in. hole, and a 6¼-in. flanged nose with a taper pilot. It is made from a steel forging and is mounted on preloaded ball bearings. All gears are mounted on ball-bearing spline shafts and gears and shafts operate in a bath of oil, all running parts being lubricated by a splash system. A wide range of spindle speeds is available through pick-off change gears, three sets of which are regularly furnished to give six spindle speeds in any one of four groups as follows: 104 to 578 r.p.m.; 149 to 832; 208 to 1160; and 289 to 1610 r.p.m. Special gears can be supplied for higher or lower speeds.

Of box type and well ribbed, the bed of the machine is designed so that the cam drum can be located conveniently under the headstock. The base contains a large coolant reservoir. The cams on the outside of the drum control all tool movements of the carriage, back arm and auxiliary facing attachment. A control drum at the end of the machine provides convenient setting of the fast and slow motion dogs and the relieving cams for the front carriage or turning head.

Three sets of feed change pick-off gears give six different rates of carriage feed, with the standard carriage cam ranging from 0.004 to 0.040 in. per revolution. Faster or slower feeds are obtainable by special cams or special feed gears. The fast

TOOLING possibilities of the 8-in. automatic are the same as in the larger Fay lathes.



motion of the machine is obtained through a clutch operated by dogs on the control drum. The lathe is stopped by a dog on the control drum contacting with an automatic switch.

The carriage is adjustable on the center bar to suit various work. It has a cross-slide which is controlled with a lead screw and graduated handwheel. The carriage is supported on a hardened and ground adjustable former, which is mounted on a relieving slide arranged so that at the end of the turning cut the tools can be relieved to prevent scoring the work on the return stroke. The return stroke is also automatic.

Carried on a ground steel bar

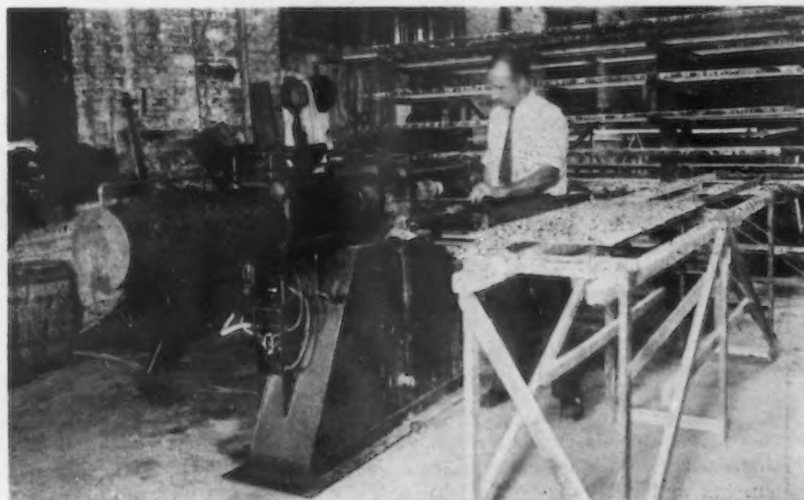
mounted in three bearings, the back arm is operated by a hardened and ground former mounted on the rear former slide. It is equipped with an adjustable follower shoe so that it is easily arranged for various diameters. The tailstock can be furnished with either screw or lever-operated ram. The ram is 3¼ in. in diameter and is equipped with a ball-bearing revolving center.

Standard machines are made in two lengths: 8 x 15 in. and 8 x 45 in. The swing over the carriage is 8 in. and over the center bar, 11 in. The smaller machine occupies floor space of 32 x 70 in. and weighs 2850 lb. net, and the larger machine occupies floor space of 32 x 100 in. and weighs 3600 lb.

Welding Rods Coated Automatically

THE accompanying illustration shows an extruding machine for coating welding rods. Operation is entirely automatic, "S" and "C" rods being fed into a hopper, and completely covered and delivered at the

other end of the machine. The machine is sold by the Electric Arc Cutting & Welding Co., 152 Jelliff Avenue, Newark, N. J., with licenses to coat the rods under the company's patents.



Die Casting Machine Features Adjustable Back Pressure of Plunger

AUTOMATIC die casting machines designed in the smaller size for die capacity of $9\frac{1}{2} \times 6 \times 9$ in. and to give 6, 10, 18 or 25 complete cycles a minute are being built by Kux-Lohner Machine Co., 2145 Lexington Street, Chicago. Features include adjustable back pressure of the plunger, from 50 to 1500 lb. per sq. in., and a core-pulling mechanism operated by power on all six sides of the die holder. The core-puller may be actuated either by mechanical or hydraulic means.

The plunger method of pumping metal is employed when using lead and zinc, and air pressure is used when filling dies with aluminum alloys. All adjustments are in view and within easy reach of the operator and any part of the unit can be set when the machine is hot. Dies can be shifted slightly to compensate for variable expansion, due to heat, after they have been clamped in place.

A die squeezing device puts the two halves of a die under an additional squeeze during the time that the metal is being forced into the die. At that interval all power-driven mechanism is at complete rest, remaining so while the metal is chilling under pressure. The plunger is operated by means of a compression spring rather than by direct power from the drive. A mechanism is provided to stop the die holder at the open position so that inserts can be added and the die cleaned and inspected. A hand lever operating through a clutch permits intermittent operation when desired. Metal is heated either by gas or electricity.

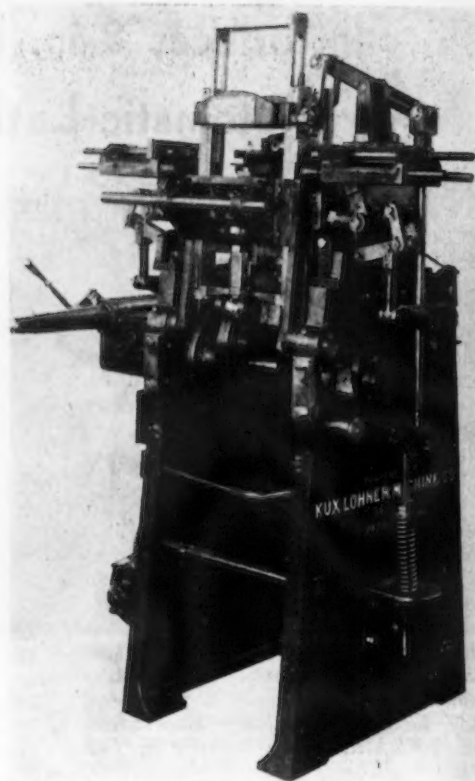
Alloy steels and steel castings are used in the construction, and all gears run in oil.

Three sizes of the machine are made. The model A takes dies up to $9\frac{1}{2} \times 6 \times 9$ in. and the dies open $4\frac{1}{4}$ in. The four speeds range from 6 to 25 shots per minute depending upon the size, shape and weight of castings. Capacity of the melting pot is 100 lb. and the metal per shot is approximately 10 cu. in. A 1-hp. motor is used. Floor space of 4×4 ft. is required. The model B machine has die capacity of $18 \times 10 \times 10$ in. and the dies open 8 in. Speeds range from 2 to 7 shots per min. The metal shot is 35 cu. in., and pot capacity is 500

BACK pressure of the plunger is adjustable from 50 to 1500 lb. A power-actuated core pulling mechanism is also incorporated.

lb. of zinc base metal. Floor space of 5×5 ft. is required. A model C machine, now being designed, will have

die capacity of 36×24 in., and the die will open 15 to 18 in. The speed will be about two shots per minute.



Coated Abrasives Made By New Process

INCREASED efficiency ranging from 20 to 60 per cent is claimed for coated abrasives made by a new electrocoating process. In this the abrasive particles are brought into an electrostatic field which first polarizes them by induction, causing them to stand upright. It also rearranges them in close pattern, each particle at the same distance from its neighbors, and is said then to hurl them like arrows into the glued paper, imbedding them firmly, points up and evenly dispersed.

Unusually uniform grinding and abrading action is attributed to the uniform coating thus produced. The maximum number of cutting edges and tips per total number of particles and per square inch of sandpaper is presented to the work, since all particles are set upright. These in turn result in faster cutting action, longer life, improved finish and lower cost.

These coated abrasives are manufactured in all standard grit numbers from fine to coarse, in coatings of garnet, silicon-carbide and aluminum-oxide; on backings of paper, cloth or combination; and in disks, belts, rolls, sheets and molded forms. They are made by the following com-

panies: Armour Sand Paper Works, Chicago; Behr-Manning Corp., Troy, N. Y.; Carborundum Co., Niagara Falls, N. Y., and the Minnesota Mining & Mfg. Co., St. Paul, Minn.

A SHEET lead rolling mill has been put into operation at Sheffield, England. It is capable of producing a sheet 8 ft. wide and has a daily capacity of 18 tons. It was erected in a former Bessemer steel works for H. Polan & Co., Ltd., maker since 1923 in Sheffield of lead piping.

According to *The Engineer*, the lead ingots, which come from the Broken Hill mines in Australia, are fed to a gas-heated furnace of 8 tons capacity. About $4\frac{1}{2}$ hr. are required for the heating and melting, after which the molten lead is run off into a gas-heated casting plate 8 ft. in length and $5\frac{1}{2}$ ft. broad. After a quarter of an hour the casting has sufficiently cooled to be lifted by a 10-ton crane to the bed of the rolling mill. It is then trimmed by an electrically operated guillotine and the slab is rolled out to the required dimensions. The mill, which was supplied by a Scottish firm, has a length of 80 ft.

Notable Sheet Making Records in India

PRODUCTION records for 27 consecutive weeks of the mechanized sheet mill (Unit No. 1) of the Tata Iron & Steel Co., Ltd., Jamshedpur, India, have become available. During August the average output per shift of 8 hr. was 38.29 tons and the indications are that the September average will be 40 tons. The remodeling of the original mill, which in 1932 averaged 10.7 tons per mill per shift, was authorized on the assurance of the Perin Engineering Co., 11 West Forty-second Street, New York, consulting engineer, that with the alterations proposed the revamped mill would produce an average of 30 tons per shift.

A brief description of the changes that were made and the performance of the early weeks of operation were detailed in THE IRON AGE of May 11, page 745. The story of the operations meanwhile is told graphically in the accompanying chart. This diagram gives the average output for each of the 27 weeks up to and including the week ended Sept. 9. The averages are in tons of 2240 lb. of sheared and weighed metal. The top curve shows the maximum production of any one shift for each of the weeks, and the horizontal lines represent the average monthly production per shift.

The following are some of the records:

Highest output for one 8-hr. shift, tons	57.
Best average production per shift in one week, tons	41.3
Best production in 16 shifts (1 week), tons	661.
Highest average number of pairs finished per shift in 1 week	1050.
Maximum production in any 24 consecutive hours, tons	153.85

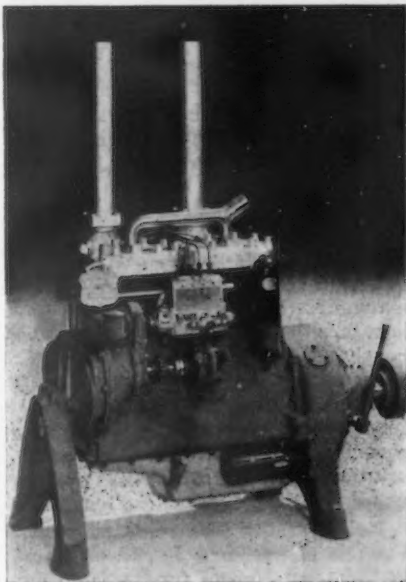
Up to and including the week ended Aug. 19, the maximum number of pairs, finished in one 8-hr. shift was 1278.5. After the first two months of operation the promised average of 30 tons per shift was raised to 37.5 tons as properly to be expected throughout the 800 shifts of one year. Frank L. Estep, vice-president, Perin Engineering Co., believes that the records are higher than those made with similar equipment in other countries, including the United States.

Mono-Valve Type Diesel Engine

FLEXIBILITY combined with simplicity of construction and high operating efficiency is claimed for new Diesel engines announced by the American Diesel Engine Co., Oak-

land, Cal. These engines are for stationary and agricultural power applications as well as for automotive and marine installations, and are built in a range of sizes, from one to eight cylinders.

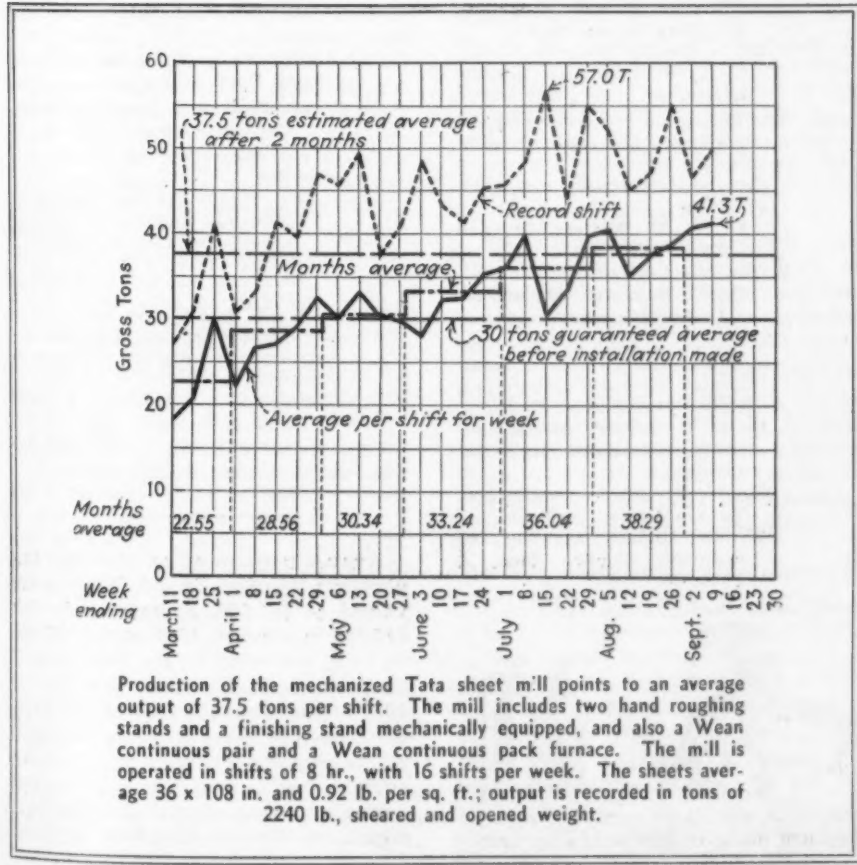
Of L-head design, the new engine employs one valve for each cylinder. More than 75 hp. is delivered by the four-cylinder model operating at its maximum speed, 1200 r.p.m., at which speed the fuel consumption is 0.44 lb. per hp.-hr. Improved construction is said to have resulted in a very flat operating torque curve, with consequent reduction of fuel consumption to less than an average of 0.50 lb. per hp.-hr. over the entire speed range of 200 to 2000 r.p.m. Standardized construction is followed through-



out, pistons, rings, rods and valves being interchangeable, thereby greatly simplifying repairs and parts replacement.

Portable X-Ray Unit Exhibited at Chicago

THE smallest X-ray set built in this country was demonstrated at a recent meeting of the American Congress of Radiology at Chicago. The unit is a new development of the General Electric X-Ray Corp., and is rated at 58,000 volts and 10 milliamperes. It is designed to operate from an ordinary light socket, is shock-proof and may be operated in perfect safety by a layman. The small set is capable of making X-ray photographs of the entire human body, or it may be carried around and used for making fluoroscopic examinations in industrial plants. It can also be used to examine airplane parts, to inspect suspicious baggage or packages, or to detect unsound portions of thin fabricated metal.



Metallurgical Advisory Board to Carnegie Tech Will Meet in Pittsburgh, Oct. 20

THE Carnegie Institute of Technology, Pittsburgh, will hold the seventh annual open meeting of the Metallurgical Advisory Board in that city on Oct. 20. Reports of research activities at Carnegie will be made by investigators and will be discussed by members of the industry, thus furnishing a valuable interchange of opinion between the theoretical and practical side of steel making.

The opening report will be made by Dr. Robert F. Mehl, director of the metals research laboratory at Carnegie. During the first year of its reorganization the laboratory has undertaken a number of new lines of research. The studies of iron-manganese and iron-manganese-carbon alloys has been continued throughout the year and will be reported. The constitution of the ternary iron-manganese-carbon alloys with 2.5 and 4.5 per cent manganese has been finished; the electrical conductivity and thermal magnetic properties of binary magnetic alloys have been investigated; and the constitution of high manganese binary iron-manganese alloys has been studied. The studies nearly complete the proposed program on these alloys. In addition to these research subjects the laboratory has inaugurated two new general programs, on precipitation from solid solutions and on internal strains in metals.

New work will be reported by Dr. Francis M. Walters, Jr., on the study of the formation of ferrite from austenite in low carbon steels in which a new dilatometer will be described which may be of considerable use in metallurgical investigations. The studies on internal strain, to be reported by Dr. C. S. Barrett, have to do principally with X-ray determinations of internal strains in worked and heated metals and alloys. A new X-ray method will be reported which offers an opportunity to determine stress distribution in the surface of stressed materials. The complete research program on this subject will be presented and discussed at the meeting.

Dr. V. N. Krivobok, head of graduate metallurgical work at Carnegie, will report on his recent studies of corrosion-resisting and heat-resisting alloys.

The work of the research staff of the Metallurgical Advisory Board for the year has consisted chiefly in open-hearth studies designed to enable the operator to control the finishing stages of liquid steel manufacture to a much finer degree than has been heretofore possible. To date, methods have been worked out in detail for high carbon steels, and studies have been started on low carbon steels for deep drawn

products. As a corollary to this work the problems of variation in response to heat treatment and age hardening are being studied with particular respect to the effect of the oxygen content of liquid steel. In this connection non-aging steels have been produced which have properties superior to the ordinary structural steels with regard to the ductility of the steel and its ability to withstand high temperature heat treatment without detriment to its physical properties. This work will be described by Dr. Charles H. Herty, Jr., director of cooperative research, and his assistants.

The program for the meeting, to be held at the Carnegie Union, Administration Hall, Carnegie Institute of Technology, is as follows:

Friday, Oct. 20: Morning Session, Jerome Strauss, presiding.

9.15: Address of Welcome
Dr. F. N. Speller, chairman,
Metallurgical Advisory Board.

9.20: General Report on Work of
Metals Research Laboratory
Dr. R. F. Mehl

10.00: Progress Report on Research on
Plastic Deformation and Internal
Strain
Dr. C. S. Barrett and Dr. M.
Gensamer.

10.30: Discussion
R. L. Templin, chief engineer
of tests, Aluminum Co. of
America
A. V. de Forest, consulting
metallurgical engineer
Dr. A. Nadal, research laboratory,
Westinghouse Electric
& Mfg. Co.

10.45: The Formation of Ferrite and Cementite from Austenite on Slow Cooling
1. Dilatometric Studies and Alloy Structure
Dr. F. M. Walters, Jr., and
Dr. C. Wells
2. The Effect of Deoxidation
Dr. C. H. Herty, Jr., and D.
L. McBride

11.40: Discussion
E. S. Davenport, research metallurgist, Research Laboratory, United States Steel Corp.
Dr. O. E. Harder, assistant director, Battelle Memorial Institute.
H. W. McQuaid, metallurgist, Timken Detroit Axle Co.
W. G. Hildorf, metallurgical engineer, Timken Steel & Tube Co.



Afternoon Session: L. F. Reinartz, presiding

The presiding officer at this session represents the open-hearth committee of the American Institute of Mining and Metallurgical Engineers.

2.00: Further Investigations of Corrosion-resisting and Heat-resisting Alloys

Dr. V. N. Krivobok

2.20: Discussion

George Eaton, director of research, Spang, Chalfant & Co.

2.30: The Control of Iron Oxide in Open-Hearth Slags

Dr. C. H. Herty, Jr., and C. F. Christopher

3.35: Discussion

J. W. Kinneary, chief metallurgist, Homestead Works, Carnegie Steel Co.

R. O. Griffiths, associate director, research laboratories, American Rolling Mill Co.

W. J. Reagan, assistant open-hearth superintendent, Edgewater Steel Co.

3.50: The Effect of Deoxidation on the Aging of Mild Steel

Dr. C. H. Herty, Jr.

4.15: Discussion

Dr. Anson Hayes, director, research laboratories, American Rolling Mill Co.

Samuel Epstein, research metallurgist, Battelle Memorial Institute.

H. W. Graham, general metallurgist, Jones & Laughlin Steel Corp.

4.30: Twenty-seventh Meeting of the Metallurgical Advisory Board, Office of the President
Carnegie Institute of Technology

7.00: INFORMAL DINNER, Supper Room, Hotel Schenley

Dr. Thomas S. Baker, president, Carnegie Institute of Technology, presiding

Address

Dr. Virgil Jordan, president, National Industrial Conference Board, Inc., New York
Dinner Ticket, \$1.50

SATURDAY OCT. 21

10.00-12.00: Inspection of the laboratories of the Carnegie Institute of Technology

Informal discussion with members of research staffs

(The public is invited to the dinner as well as to the technical meetings)

August imports of agricultural implements into the United States were valued at \$82,936, as compared with \$40,234 in August, 1932, and \$156,781 in July, according to the Department of Commerce. With the exception of 1000 cream separators valued at \$15,930 imported from Sweden, the bulk of the imports during August of the current year consisted of unclassified agricultural implements and parts, of which the United Kingdom supplied \$25,703 and Canada, \$15,784.

Consolidated Specifications for Carbon Steel Castings Approved

CONSOLIDATED specifications for carbon steel castings for industrial, railroad, and marine uses were recently approved for publication as tentative by the American Society for Testing Materials on the recommendation of its committee A-1 on steel. Certain confusion had arisen due to the fact that the present specifications for carbon steel castings had varying requirements for the same grades of steel. It was realized that the interests of producers and consumers would best be served if major requirements for identical grades were made uniform with exceptions noted as justified for castings for certain special purposes.

The special committee which was appointed to investigate the whole matter for committee A-1 included in its personnel representatives of various organizations interested in steel castings, such as the American Railway Association, Steel Founders' Society of America, American Foundrymen's Association, U. S. Navy, etc.

This group found that its objectives could best be obtained by drafting a consolidated specification which could ultimately supersede the present specifications A 27 and A 87, generally called the miscellaneous and railroad steel castings respectively. Specifications A 27 contain a supplement applying exclusively to ship castings. The committee has put in the body of the new specifications all general clauses that apply to general railroad and marine applications and in supplements requirements applying exclusively to marine and railroad castings. The committee urged the approval of the proposed specifications as representing the most satisfactory present basis for harmonizing differences of opinion held by informed persons regarding proper purchase requirements for the material.

Castings for Which No Physical Requirements Are Named

The specifications apply to carbon steel castings for miscellaneous and jobbing purposes, for locomotive and car equipment and for ship construction. Two classes and five grades are provided for. Class A consists of one grade designated as special No. 1 for which no physical requirements are specified. Class B consists of four grades, Regular, Special No. 2, Special No. 3 and Special No. 4, for all of which physical requirements are specified.

The steel is to be made by one or more of the following processes: Open-hearth, electric furnace, converter, or crucible. Detailed requirements for heat treatment are included. The maximum carbon content of class A castings is put at 0.45 per cent, with

manganese 0.50 to 1.00; silicon, 0.20 to 0.75; maximum phosphorus, 0.05; maximum sulphur, 0.06. No carbon content is specified for class B castings inasmuch as physical requirements are given and the requirements for the other elements are the same as in the class A castings. The tensile requirements for class B castings are as follows:

Class B Castings Comprise Four Grades

	Regular	Special No. 2	Special No. 3	Special No. 4
Tensile strength, lb. per sq. in.	70,000	60,000	60,000	80,000
Yield point, lb. per sq. in.	38,000	30,000	30,000	43,000
Elongation in 2 in. per cent.	24	22	26	17
Reduction of area, per cent.	36	30	38	25

The Regular grade is the cast steel required for most miscellaneous structural purposes, for large tonnages of castings for railway rolling stock and for many castings for ships. This grade is readily machined. Special grades Nos. 2 and 3 are used mainly for large special castings for railway equipment; these grades are intended to have low carbon content making the material very easily machineable, either in the as-cast or in the annealed condition. Special grade No. 4 is used for purposes calling for higher strength and less required ductility than are typical of the Regular grade. It is usually machineable without appreciable difficulty with modern machine tools.

The supplement for marine castings provides that all castings shall be of the Regular grade Class B. Coupons representing each of certain special castings must be tested in tension and in bending. Castings listed include stern frame, rudder, steering quadrant, propeller shaft bracket, tiller, etc. Requirements are included for bend and percussion tests.

The supplement for railroad castings requires that tension tests be made from bars attached to each locomotive frame, locomotive cylinder, wheel center, etc.

The actual promulgation of the consolidated specifications was in charge of a committee headed by R. A. Bull, consultant on steel castings, Chicago. Copies of the specifications can be obtained from A.S.T.M. headquarters, 1315 Spruce Street, Philadelphia.

Methods of Impact Testing Approved

Committee E-10 on standards which acted for the society in approving the carbon steel castings specifications also approved, for publication as tentative, methods of impact testing of metallic materials. These methods establish a standardized procedure for notched-bar impact tests used for the comparison of the brittleness of metals. They are based on the best

present-day practice and have been prepared following a questionnaire submitted to a large number of firms and laboratories interested in impact testing. A full discussion of the scope of the test and a detailed calibration method are given.

At its meeting committee E-10 also approved as tentative revisions in the methods of Rockwell hardness testing of metallic materials. The revisions include modifications in the requirements for Rockwell test procedure as well as extensive editorial improve-

ment in the text. Several of the changes clarify the use of the methods for ferrous materials.

Plans Are Completed For A. I. & S. E. E. Convention

THE various committees of the Association of Iron and Steel Electrical Engineers have completed plans for the convention and iron and steel exposition to be held Oct. 17 to 19 at the William Penn Hotel, Pittsburgh. The technical sessions will include 21 papers on mechanical, electrical, lubrication and combustion subjects. As in previous years, the iron and steel exposition is expected to be one of the major features of the convention. A large number of manufacturers, who service the iron and steel industry, have already secured space to display new developments in their products and equipment.

A special convention feature will be an inspection trip to the plants of the Allegheny Steel Co., Brackenridge, Pa., and the American Sheet & Tin Plate Co., Vandergrift, Pa., on Oct. 18.

Gear Makers to Discuss Code

THE semi-annual meeting of the American Gear Manufacturers Association will be held at the Penn-Lincoln Hotel, Wilkensburg, Pa., Oct. 17 and 18. One session will be devoted to discussion of the association's code. Topics at other sessions will include merchandising and technical practices, cost accounting, and the training of operators. E. W. Miller, chief engineer, Fellows Gear Shaper Co., and president of the association will preside. J. C. McQuiston, First National Bank Building, Wilkensburg, Pa., is secretary of the association.

Central Statistical Board Completes Personnel

With the recent selection of five additional members, the personnel of the Government's Central Statistical Board, established by Executive Order of July 27, has been completed, according to Morris A. Copeland, the board's executive secretary, Commerce Building, Washington.

The five new members, each of whom was selected by the board, are:

E. Dana Durand, chief economist, Tariff Commission

Corrington Gill, director of research and statistics, Federal Emergency Relief Administration

Stuart A. Rice, assistant director, Bureau of the Census

O. M. W. Sprague, financial executive assistant to the Secretary of the Treasury (W. R. Stark, chief of section of financial and economic research of the Treasury Department, alternate)

O. C. Stine, chief of division of statistical and historical research, Bureau of Agricultural Economics

Winfield W. Riefler, who has been named chairman of the board, was designated as a member by Executive Order of Aug. 3.

The following members were designated by the officials indicated, in accordance with the provisions of the Executive Order:

By Secretary of the Interior:

Oscar E. Kiessling, pro tem, chief economist of the mineral statistics division, Bureau of Mines

By Secretary of Agriculture:

Mordecai Ezekiel, economic adviser to the Secretary of Agriculture (Louis H. Bean, economic adviser to the Agricultural Adjustment Administration, alternate)

By Secretary of Commerce:

John Dickinson, Assistant Secretary of Commerce (William L. Austin, director of the Bureau of the Census, alternate)

By Secretary of Labor:

Isador Lubin, Commissioner of Labor Statistics

By the Governor of the Federal Reserve Board:

E. A. Goldenwelder, director of research and statistics, Federal Reserve Board

By National Industrial Recovery Administrator:

Alexander Sachs, chief of division of economic research and planning, National Recovery Administration

Meredith B. Givens, executive secretary of the Committee on Government Statistics and Information Services, was named from that committee, in accordance with the Executive Order creating the board.

The Central Statistical Board, according to the terms of the Executive Order, is empowered to "appraise and advise upon all schedules of all Government agencies engaged in the primary collection of statistics required in carrying out the purposes of the National Industrial Act, to review plans for tabulation and classification of such statistics, and to promote the

coordination and improvement of the statistical services involved."

Although the work of the board, by the terms of its establishment, is limited to statistics bearing on recovery, the board may be regarded as the successor of the Federal Statistical Board, which has recently been dissolved. The Federal Statistics Board itself was the successor of the Central Statistical Bureau which operated during the war. Like the Federal Statistics Board, the new Central Statistical Board has advisory powers only.

Employment and Wages

Increased in August

AN increase of 8.6 per cent in the number of persons employed, an advance of 9.2 per cent in average hourly earnings, and a decline of 8.9 per cent in average hours of work per week in manufacturing industry during August are reported by the National Industrial Conference Board.

Average hourly earnings of wage-earners in 25 manufacturing industries reporting to the board rose from 45.5c. in July to 49.7c. in August, while average hours of work per week fell from 42.6 to 38.8. The net result was a slight rise of 10c. or 0.5 per cent in average weekly earnings, which were \$19.15 in July and \$19.25 in August. Since the cost of living rose relatively more between these two months than did average weekly earnings, real weekly earnings declined 1.8 per cent.

The number of persons employed increased 8.6 per cent in August over July and, since the average weekly pay increased slightly in August, total payroll disbursements in the 25 manufacturing industries rose over 9 per cent. Total man-hours worked were 1.2 per cent less in August than in July.

Importing Associations

Preparing Master Code

IN order to secure importers against the contingency under the NRA of becoming subject to a variety of codes with conflicting terms, a central committee of importers has been formed and empowered a code committee, headed by C. E. Bingham of the American Exporters and Importers Association, to develop a tentative program to meet the importers' problems and to study the possibility of evolving an import master code of fair competition for submission in code form to the NRA.

Those import trade associations which are preparing their own codes are conferring with the import committee with a view to cooperating in other matters of administrative importance and to avoid the possibility

of jurisdictional conflict. For those import trades that are not preparing individual codes the central committee proposes to follow the precedent set by the construction industry, and formulate such code requirements in terms of a master code general in nature but providing under separate sections for the separate needs of the import groups with the established administrative machinery of the associated importers accessible to secure proper treatment for each group.

Small House Conference At A. I. S. C. Meeting

AT the eleventh annual convention of the American Institute of Steel Construction, which will be held at the Stevens Hotel, Chicago, Oct. 19 and 20, a small house conference will be held which will be presided over by Fred T. Llewellyn, United States Steel Corp., New York. This will supplement the usual business sessions at which business and technical problems of the industry will be considered, and the all-day session which will be devoted exclusively to the code of fair competition.

Lower Freight Rates On Cast Iron Pipe

IN an opinion announced Sept. 19, the Interstate Commerce Commission authorized railroads to reduce rates on cast iron pipe in carloads from Coshocton and Newcomerstown, Ohio, to Chicago and intermediate points in Indiana. The present rates to Chicago from Coshocton and Newcomerstown of \$5.80 and \$6 per net ton, respectively, exclusive of the surcharge of 40c. will be reduced from and to all points concerned to \$4.50 per ton, exclusive of surcharge, which will be eliminated Sept. 30. The new rates will become effective Sept. 26 and will expire Dec. 31. The reduced rates were sought by the railroads because of truck competition, and will result in reductions to most all intermediate points in Indiana as well as to Chicago.

Edgar T. Ward's Opens Pittsburgh Warehouse

THE Edgar T. Ward's Sons Co. is opening a warehouse in Pittsburgh, the ninth in its national chain. The new warehouse is on Woodkirk Street and will carry the following commodities: cold-finished steel bars in rounds, squares, hexagons and flats; cold drawn and turned and polished shafting; cold-rolled strip steel; cold-rolled round edge flat wire; shim steel; drill rod, and music wire.

Theodore A. Harper is the manager of the warehouse.

Triple Supply Convention Studies Business Opportunities Under the NRA

WASHINGTON, Oct. 3.—Taking as its theme the National Recovery Act, the Triple Mill Supply Convention held at the Wardman Park Hotel here Sept. 25, 26 and 27, hailed the law as offering opportunities to make their industry profitable.

The organizations attending the convention are the Southern Supply and Machinery Distributors' Association, the National Supply and Machinery Distributors' Association, and the American Supply and Machinery Manufacturers' Association. On the third day a hearing was held before Assistant Deputy George S. Brady on the code of fair competition presented by the first two associations.

Presiding at the opening session, H. E. Ruhf, the Cleveland Tool & Supply Co., Cleveland, president of the National Supply and Machinery Distributors' Association, outlined the fundamentals of the Recovery Act and said that it requires a new viewpoint in business. He declared that it has opened up the way for several steps which will allow trade associations to function with more freedom than in the past. It will be necessary, he said, to become reconciled to the fact that hours of employment and wages be adjusted to meet the new conditions. So far as the distributors are concerned, he expressed the opinion that they will be able to meet this problem with less difficulty than will be experienced in solving merchandising problems and some of the knotty questions in connection with the coordination of manufacturers' sales policies to fit in with the distributors' sales policies.

Cooperation Between Distributors and Manufacturers Essential

"The distributor's welfare is affected more by the competitive conditions in the various manufacturing industries he represents than he is by the competition in his own distributor industry," said Mr. Ruhf.

"If our manufacturing friends will get together in their respective lines, create codes of fair competition, keeping in mind the distributor, his functions and his valuable contribution toward economic distribution, and set up adequate differentials, the distributors should have no great difficulty in getting their houses and industry in order."

Mr. Ruhf said he firmly believes this action is being taken, adding that never before has he seen such interest on the part of manufac-

turers in the distributors' problems. He predicted that within the next few weeks manufacturers will extend to distributors differentials that will be more consistent with distributors' costs. He declared that the manufacturer can solve the problem of costs if he will talk over the matter with his distributors and obtain their view, and then, keeping in mind their suggestions, set a differential that he feels will be fair and productive of the best interest and results. He urged a breakdown of costs of each line handled by distributors.

Mr. Ruhf criticized the manufacturer who straddles in the matter of distribution policies. He said the distributor had no bones to pick with those manufacturers who believe their interests are best served by going to the consumer direct. He insisted, however, that no consumer, regardless of the size of his purchase, is entitled to the same or lower prices than a jobber or a distributor on those commodities usually recognized as being standard mill supply items, "because the consumer buys these commodities only because he needs them, not because he is interested in this particular manufacturer's line." On the other hand, it was added, the distributor is interested in promoting the line and spends his money and effort in developing it.

No Time for Sharp Practices

H. F. Seymour, president of the American Supply and Machinery Manufacturers' Association and of the Columbian Vise & Mfg. Co., Cleveland, said that in order to derive the benefits from the Recovery Act, it is good business to be honest with labor, customers, competitors "and ourselves." This, he said, is no time for the chiseler and no place for the cheater. He declared that the sharp practice man may think he is getting along well, but one day will wake up facing the penalty of the law.

"It is not only conceivable, but probable, that a certain part of the industry will have to be discontinued," said Mr. Seymour. "We already see the Government forcing curtailment of production of various commodities; possibly it will be necessary to eliminate 10 per cent of industry. President Roosevelt in one of his radio talks said, 'The unfair 10 per cent could produce goods so cheaply that the fair 90 per cent would be compelled to meet the unfair conditions. Here is where the Government comes in. Government ought to have the right

and will have the right, after surveying and planning for an industry, to prevent, with the assistance of the overwhelming majority of that industry, unfair practice and to enforce this agreement by the authority of the Government.'"

This would not necessarily mean price advances, Mr. Seymour pointed out, but it should mean price stabilization. Neither, he said, would it necessarily mean the elimination of the small concern. It was stated that it is often the large company which is the offender. Citing certain practices as an example, Mr. Seymour declared that a distributor who is selling a first-class line and then takes on a secondary line for the purpose of cheap bidding is a parasite.

Manufacturers, he explained, are not blameless. A manufacturer, it was declared, is equally guilty when he has first-class distribution, then puts his line in with one "of these office-in-his-hat distributors."

New Order Puts Premium on Salesmanship

"Every manufacturer and distributor alike will be affected by this National Recovery Act, which in a way will change the ordinary method of business from the natural basis of supply and demand to a more regulated basis," said Mr. Seymour. "Methods will be more ethical, resale policies more effective, the duties of the buyer will not be less arduous, but will be more discriminatory, and those of the seller more strenuous. I believe many competitors will find themselves selling under practically the same conditions, and this will call for salesmanship of the highest order, not price-cutting. The buyer must determine values as measured by policies, fair play, soundness of the company and service, in addition to the product."

Discussion of the code prepared by the Fabricated Metal Products Federation occupied the session of the manufacturers. Hearing on the code will be held on Thursday of the present week. H. D. North, president of the federation and of the Ferry Cap & Screw Co., Cleveland, told of the work of the federation, discussion of which was led by H. S. Kimball, manager of the federation.

With Alvin M. Smith, president of the Smith-Courtney Co., Richmond, Va., and secretary-treasurer of the Southern Supply and Machinery Distributors' Association, presiding, a meeting of distributors and manufac-

turers met Tuesday morning under the auspices of the Joint Merchandising Committee of the Mill Supply Industries. At a meeting on the previous day, Mr. Smith emphasized the view that the National Recovery Act is very definitely a labor law and that unfair trade practices probably would be limited until employment increased.

Buying of Capital Goods Imperative

In the course of an address before the convention Tuesday morning, Deputy Administrator Malcolm Muir declared that he could not emphasize too strongly the fact that NRA is alert to the need for stimulating buying in the capital goods industries.

"It is unfortunate that in the confusing, early days of NRA the idea was allowed to get abroad that no new machinery was to be bought by industry," said Mr. Muir. "Since then, soberer analysis has shown that unless we have recovery of the capital goods industry, we shall have no real general recovery."

Describing the swift rise of the business curve since the middle of March, 1933, Mr. Muir said the only worry is as to what extent it will continue without the recovery of the capital goods industry. He explained that wholesalers and dealers, anticipating that prices were going up, bought fast and furiously with the result that their orders brought about a 48 per cent rise in the manufacture of consumers' goods. The question, he said, is as to whether these goods will go from the warehouses and the dealers' shelves into the hands of the public.

Until recently, Mr. Muir stated, statistics indicated that retail sales have increased only 12 per cent, while manufacturing increased 48 per cent. Perhaps the reason for the lag, it was stated, lies in the fact that the capital goods industry which had fallen two-thirds below its 1929 level has come back only one-fifth of the way and so has reemployed a correspondingly small number of workers. It was pointed out that, in 1929, the capital goods industry and those producing material and services entering into both capital and consumers' goods employed approximately 10,000,000 workers or one-half the number of workers employed by the consumers' goods and the capital goods industries.

"In view of that could anyone doubt the patriotism of the plant that modernizes its plant and replaces its old machinery—or the patriotism of the manufacturer who sells to it?" Mr. Muir asked.

Plant Modernization Essential to Survival

He spoke of the advantageous position of the low-cost plants, explaining that the NRA codes prohibit an individual manufacturer selling below his own cost but not below his competitor's cost. For this reason it was said

that the high-cost plant which refuses to see the advantage of using modern, up-to-date machinery and continues to tolerate obsolescence virtually decides to commit commercial suicide.

"Now suppose you persuaded this plant to modernize, to construct a new efficient plant, to install modern equipment and methods, to reduce costs to competitive levels," Mr. Muir continued. "Then this plant could survive, then it could continue to provide employment and could continue to contribute to the economic and social welfare of its community. In addition, this plant would be helping to revive the prostrated industry of capital goods—would be doing its share of putting 10,000,000 workers normally employed in the capital goods industry back to work."

A Big Sales Opportunity

He told members of the convention that they have the problem of realigning their sales thinking. Expansion of plant capacity on which many had depended for business under the new conditions will not be the big factor, he said. Modernization of existing facilities to meet new manufacturing and cost conditions, it was declared, will be the big factor.

He said that there was little need to detail sales opportunities that exist, for example, due to the extensive neglect of equipment during the past few years, or the business available if nothing more were done than bring idle machines that have been robbed of spare parts back to operating conditions.

"To the extent that you as distributors recognize the changed conditions under which your selling must go forward and create sales, to that extent will you be recognized as a factor in distribution in the next few years.

"As I view the New Deal under the NRA, the biggest handicap to busi-

ness, namely, 'profitless selling,' is out of the window, never, I hope, to return. All of the ingenuity, which has brought about our present civilization, of laboratory, designing room and invention, will have free play to supply the new wants and new needs of the great masses of new purchasing power being created."

Election of Officers

On Tuesday, the National and American associations reelected incumbent officers for another term.

Officers of the three associations are as follows:

Southern Supply and Machinery Distributors' Association:

C. C. Krueger, president
T. W. Lewis, first vice-president
F. M. Archer, second vice-president
Alvin M. Smith, secretary-treasurer

National Supply and Machinery Distributors' Association

H. E. Ruhf, president
Wm. T. Todd, Jr., first vice-president
E. B. Hunn, second vice-president
George A. Fernley, secretary-treasurer

American Supply and Machinery Manufacturers' Association, Inc.

H. F. Seymour, president
J. Harvey Williams, first vice-president
L. M. Knouse, second vice-president
W. H. Fisher, treasurer
R. Kennedy Hanson, secretary-manager

The General Electric Co. will feature its new solenoid-operated oil circuit breakers at the exposition of the A. I. & S. E. E., to be held in Pittsburgh, Oct. 17-19. The company will also display air breakers to replace fuses, a cutaway gear motor and photo-electric equipment.

The American Rolling Mill Co., Middletown, Ohio, has declared operative the plan providing for the exchange of three-year 4½ per cent gold notes of the company, due Nov. 1, 1933, for new 5 per cent convertible notes due Nov. 1, 1938.



THESE fire pails, which have been turned out by the Wheeling Corrugating Co., Wheeling, W. Va., for Admiral Byrd's second Antarctic expedition, are of particularly heavy construction, and adapted to the unusual uses to which they will be put. All of the pails have been hand dipped in pure molten zinc.

Is Rail Price Reduction Justified?

By T. H. GERKEN
News Editor, The Iron Age



T. H. GERKEN

INITIAL response by the railroads to the Government's plan for financing rail purchases from the Public Works Administration if a price reduction is made by the rail manufacturers has not been particularly gratifying. Not more than 250,000 tons has been promised and many of the principal carriers have been heard from. The minimum of 600,000 tons, on which the rail makers agreed to submit competitive bids, seems far from realization. Much of the tonnage mentioned thus far is admittedly for 1934 needs and will not be required before spring. Even though specified for rolling during the winter months, the immediate benefit to the steel industry is rather remote. The Government's insistence upon a price reduction to bring out this business seems to be far less justified than was the case when negotiations were begun.

The trend of rail prices in the United States is fairly well known, particularly over the last 20 years. Before the War a quotation of \$28 a gross ton prevailed for many years, but increased costs during the war period forced this figure as high as \$97, before it dropped to \$43 in 1923 and remained unchanged for nine years. Late in 1932, without the benefit of outside pressure, the price of rails was reduced to \$40 a ton. At that time, it was generally expected in the trade that much buying would result. This buying failed to materialize. Rail purchases during the entire year amounted to less than 400,000 tons, as compared with a recent 20-year average of about 2,500,000 tons. This year's purchases have been even less than the corresponding 1932 totals and have included a large order for export to South America.

An Unfortunate Precedent

It was recently suggested in semi-official circles that a reduction in price, ranging from \$1 to \$5 a ton, might result in orders from the carriers variously estimated at from 600,000 to 1,000,000 tons of rails.

Using the maximum figures, the railroads might thus save as much as \$5,000,000, but conservative estimate would certainly not place the figure above \$2,000,000. At any rate, it is but a very small part of the outlay which must be made by the carriers if full replacement needs are taken into consideration and financed by the Federal Government. The steel industry, however, which has just been saddled with cost increases amounting to \$100,000,000 by the National Industrial Recovery Act, was cheerfully asked to bear the added burden.

It is true that only four companies are primarily interested in the price of rails and one of them is in receivership. But if the Government is allowed to dictate the price on one finished steel commodity, would it not feel encouraged to extend the practice? It would not be difficult to imagine a sudden decision in Washington, to the effect that the public works program could not go ahead unless structural shapes and reinforcing bars were reduced \$5 a ton, or that future Naval building plans might have to be held up until steel plate prices were reduced to bargain levels. A precedent in the case of rails would not be healthy.

Rail Production Costs Higher

Despite the general belief, dating from the days of Andrew Carnegie, that rails are a relatively profitable product, conditions have changed to such an extent in the last 20 years that the margin of profit has been largely obliterated. If the country's



rail mills, with a capacity for nearly 3,750,000 tons annually, were steadily engaged, the \$40 price might be relatively profitable, but when production falls to 400,000 tons or 11 per cent of capacity, fixed charges go on just the same. Even in 1929 when output of standard rails was 2,662,163 tons, mills were engaged at only 70 per cent, while the industry as a whole ran at 87.5 per cent.

The character of rail specifications over the past two decades has also grown constantly more exacting. Even in 1914, the American Railway Association, the American Railway Engineering Association and the American Society for Testing Materials had each issued elaborate specifications for rail manufacture, any of which rail makers were expected to be in a position to meet. Since that time revisions have been frequent and in most cases have added to the cost of manufacture. Details of such revisions would be of interest only to a metallurgist, but recent minor changes might serve as an example. Early this year the American Railway Engineering Association issued the following revisions relating to classification markings and branding and stamping:

"All rails of a heat whose carbon content is in the upper five points of the carbon percentage of the specified range shall have both ends painted blue.

"Brands made so plain and sharp that they may be read as long as the rails are in service shall be rolled on or hot stamped into the side of the web of each rail in accordance with the following requirements:

(a) The date and order of arrangement of the branding shall be shown in a typical brand, the design of letters and numerals to be optional with manufacturer.

(b) The heat number and the ingot number as rolled shall be stamped in the web of each rail where it will not be covered by the joint bars. The data used in stamping and arrangement

thereof shall be as shown in a typical stamping (example omitted).

(c) The top rails shall normally be lettered "A," and the succeeding ones "B," "C," "D," "E," etc., consecutively, but in case top discard is greater than normal, the rail lettering shall conform to the amount of discard, the top rail becoming "B," or other succeeding letter to suit the condition. Design and size of letters and numerals to be used in stamping is also definitely specified."

The wisdom of such standardization of marking and branding is not questioned. Rail producers probably cooperated in its establishment and will be quick to conform with the procedure. But not without adding to the final cost of manufacture!

Rail Price Lower Than Composite

As pointed out in THE IRON AGE two weeks ago, the present price of rails is \$4.33 a gross ton less than the average price of finished steel products as reflected in THE IRON AGE steel composite. Yet there is probably no steel item upon which human safety depends more completely. Faulty production of a single steel rail, which escaped notice in the most exacting physical tests which science has devised, might send a crack passenger train to its destruction with an appalling loss of human life.

Foreign Rail Prices Higher

Further indication of the relatively low rail price now prevailing in this country is offered by a comparison with corresponding quotations in the principal rail making countries. As shown in the accompanying table, in no foreign country are rails for domestic consumption being sold at a lower price than in the United States. The low comparative prices on other finished steel products in the principal European steel making countries are well known.

If Lower Rail Prices, Why Not Lower Freight Rates?

In these days of all kinds of bargaining, whether collective, political or commercial, it might be interesting to apply the principle to the case under consideration. The part played by increased freight rates in the rise of steel production costs in the last 20 years is fairly well known. In the following table are shown the percentages of increase in freight rates on raw materials used in manufacturing steel products by a large representative company in the Pittsburgh and Chicago districts since 1913:

Commodity	Average 1913 Rate, G. T.	Average Present Rate, G. T.	Percentage Increase of
Dolomite	\$0.80	\$1.38	72.9
Limestone	.51	1.02	98.8
Fluorspar	2.75	5.71	108.0
Coal	.98	1.75	80.4
Coke	.58	1.15	99.4
Ore	.64	1.03	60.0
Billets	2.44	4.31	76.7

Note: Average present rates do not include emergency charge.

The price of rails has increased from \$28 to \$40 a ton, or less than 43 per cent. If the steel companies were willing to reduce the price of rails 10 per cent to \$36 a ton, would the railroads be willing to reduce freight rates on raw materials by a similar amount, or even by 5 per cent? Would they be willing even to make a reduction in freight rates on materials going into their own purchases from the steel industry? This suggestion has interesting possibilities, particularly to persons who are interested in bargains and compromises.

Steel Rail Prices in Foreign Countries

DOMESTIC PRICES REPORTED DURING 1933 F.O.B. MANUFACTURING WORKS			
		Price per 1000 Kg.	
Austria	50 lb. per yd. and over	Schillings	266.00 \$45.49
Belgium	Normal length, not over 18 meters	Bel. Frs.	1,020.00 43.51
Luxembourg	Normal length, 50 lb. per yd. and heavier	Bel. Frs.	1,056.00 45.05

Czechoslovakia	Bel. Frs.	1,100.00 46.93
France	Crowns	1,256.10 57.02
	Fr. Frs.	700.00 41.90
Germany	Not exceeding 33 kg. per meter (66 lb. per yd.). Rmk.	139.20 50.89
Hungary	Rails—Below 20 meters. Pengo	243.60 66.38
	—20 meters and over Pengo	255.80 69.70
		Price per 2240 Lb.
Great Britain	Flange rails—60 lb. per yd. and over. Up to 500 tons..	\$8-10-0 \$40.33
		9- 0-0 42.70
	Flange rails—Under 60 lb. per yd. down to and including 50 lb. per yd. Up to 500 tons.....	\$8-15-0 41.52
		9- 5-0 43.89

Note: Conversions are based on rate of exchange as of Sept. 25, 1933, namely:

Austria—Schilling	17.10c.
Belgium and Luxembourg—Belgian Franc	4.266c.
Czechoslovakia—Crown	4.54c.
France—French Franc	5.985c.
Germany—Reichsmark	36.50c.
Hungary—Pengo	27.25c.
Great Britain—£	\$4.74½

Last Minute Sales Leads

(Received too late for classification in our Plant Expansion Section)

Home Brewing Co., Harrison and Clay Streets, Richmond, Va., has plans for extensions and improvements, including new brew-house, bottling and other mechanical equipment. Cost over \$100,000 with machinery. Carneal, Johnston & Wright, Electric Building, are architects.

United States Indian Warehouse, Chicago, asks bids until Oct. 10 for augers, cutting punches, belt rivets, steel rivets, spring steel, wrought iron staples, washers, gage cocks, butt hinges, etc.

J. J. & M. Taxman Refining Co., Wichita Falls, Tex., plans rebuilding part of oil refinery, including gasoline refining division, recently destroyed by fire. Loss about \$200,000 with equipment.

City Council, Richmond, Ky., asks bids until Oct. 9 for extensions and improvements in gas system, including new meter house, regulator station and other distributing plant units, pipe lines, fittings, etc. Black & Veatch, Mutual Building, Kansas City, Mo., are consulting engineers.

Commanding Officer, Fort Bragg, N. C., has secured appropriation of \$2,167,350 for new buildings and will soon take bids for different structures, including ordnance shops, quartermaster maintenance shops, motor repair shops, gun sheds, hangar, steam heating plant for hangar, ordnance storage and distribution building, gasoline storage system, portable range towers, etc.

California Brewing Association, 2060 East Forty-ninth Street, Vernon, Cal., a subsidiary of Cereal Products Refining Corp., 762 Fulton Street, San Francisco, has approved plans for six-story brew-house, three-story stock house, two-story mechanical bottling works, and multi-story power plant. Cost over \$700,000 with equipment. E. L. Chaffee is company engineer at Vernon.

Superintendent of Lighthouses, St. George, Staten Island, N. Y., asks bids until Oct. 13 for reconditioning lightship 87, including auxiliary machinery and piping, fuel oil tanks, etc.

Wire-Welch Distillery, New Middletown, Ohio, Ezra C. Welch, head, plans extensions and improvements, including new equipment. Plant will be developed for output of over 500,000 gal. a year. Cost close to \$100,000 with equipment.

Kitsap Brewing Association, Port Orchard, Wash., Eugene Woolfolk, secretary, care of Carl Siebrand, 5016 Twenty-first Avenue, N. E., Seattle, architect, has plans for new five-story plant, with auxiliary one-story units. Cost over \$160,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Oct. 11 for traveling cranes for New York Navy Yard (postponed from Sept. 27) (Specifications 7402).

Port Hardy Pulp & Paper Co., Ltd., Port Hardy, B. C., has plans for new wood pulp distillation plant. Cost over \$200,000 with equipment.

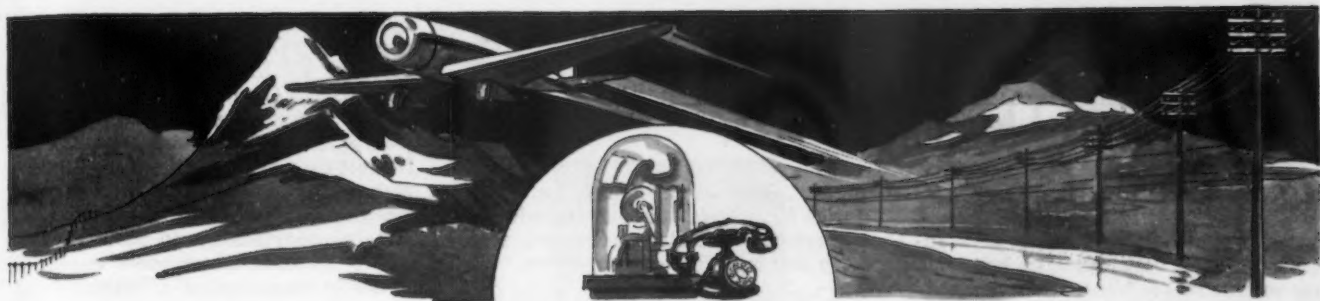
Hammond Brewing Corp., Hammond, La., recently organized with capital of \$500,000, has plans for new multi-unit plant, with power house, machine shop and other structures. Cost over \$200,000 with equipment. Samuel Stone, Jr. & Co., Masonic Temple Building, New Orleans, are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 10 for corrosion-resisting steel valves (Schedule 769); until Oct. 13, 20 electro-hydraulic steering gears, and 20 electro-hydraulic windlasses and spare parts (Schedule 770) for Eastern and Western Navy yards; four motor-driven bench precision lathes (Schedule 811) for Brooklyn, Philadelphia, Mare Island and San Diego yards.

Chicago & North Western Railway, Chester T. Dike, 400 West Madison Street, Chicago, chief engineer, is taking bids for a new head-house costing about \$50,000 at Rialto grain elevator, Milwaukee.

Wurtzburger Brewing Co., Milwaukee, recently organized, has acquired former plant of Pfister & Vogel Tanning Co., South Milwaukee, and will convert it into brewing and malting plant. Cost about \$125,000, including equipment. Herbst & Kuenzli, 1249 North Franklin Place, Milwaukee, are architects. Fred R. Zimmerman is president of Wurtzburger company.

Millard Hoop Mfg. Co., Menasha, Wis., has been organized by M. R. Millard and associates to manufacture strip and wire hoops. Factory space has been leased and equipment is being installed.



THE NEWS OF THIS WEEK

Freight Rate Allowances Are Granted Michigan Consumers of Steel Products

ARBITRARY freight rate allowances ranging from \$3 to \$5 a ton are granted steel consumers in Michigan by Commercial Resolution No. 13, approved by the directors of the American Iron and Steel Institute on Sept. 20. As referred to in THE IRON AGE last week, the allowances are deducted from the freight rates applying from the selling base to the point of delivery and apply as follows as shown in the accompanying table.

The resolution follows:

RESOLVED that any member of the code may allow in respect of any of the products hereinafter specified which it shall sell or contract to sell for delivery to any purchaser at any of the places hereinafter described for the use of such purchaser a deduction from the then published base price of such member for such product not exceeding the respective amounts hereinafter specified;

(a) On alloy steel bars (hot-rolled and cold-finished), hot-rolled carbon steel bars (merchant steel and concrete reinforcing), and blooms, billets and slabs (alloy and carbon), for delivery within the switching limits of Detroit, a deduction not exceeding an amount that shall be \$3 per ton, net or gross, as the case may be, less than the all-rail published tariff carload freight charges otherwise chargeable thereon pursuant to the provisions of Section 4 of Schedule E of the code from the

basing point on which such base price is based to said Detroit;

(b) On hot-rolled alloy steel bars, hot-rolled carbon steel bars (merchant steel and concrete reinforcing), and blooms, billets and slabs (alloy and carbon), for delivery at any place in Michigan outside the switching limits of Detroit to which the all-rail published tariff carload freight rate thereon from Pittsburgh shall be not greater than 31c. per 100 lb. prior to Oct. 1, 1933, or 29c. per 100 lb. on and after said date, a deduction not exceeding an amount that shall be \$4 per ton, net or gross, as the case may be, less than the all-rail published tariff carload freight charges otherwise chargeable thereon pursuant to the provisions of said Section 4 from the basing point on which such base price is based to such place of delivery;

(c) On cold-finished alloy steel bars for delivery at any place in Michigan outside the switching limits of Detroit to which the all-rail published tariff carload freight rate thereon from Pittsburgh shall be not greater than 33c. per 100 lb. prior to Oct. 1, 1933, or 31c. per 100 lb. on and after said date, a deduction not exceeding an amount that shall be \$4 per net ton less than the all-rail published tariff carload freight charges otherwise chargeable thereon pursuant to the provisions of said Section 4 from the basing point on which such base price is based to such place of delivery;

(d) On sheets, cold-finished carbon steel bars and hot-rolled strip steel for delivery within the switching limits of Detroit, a deduction not exceeding an amount that shall be \$4 per net ton less

than the all-rail published tariff carload freight charges otherwise chargeable thereon pursuant to the provisions of said Section 4 from the basing point on which such base price is based to said Detroit; and

(e) On sheets, cold-finished carbon steel bars and hot-rolled strip steel for delivery at any place in Michigan outside the switching limits of Detroit to which the all-rail published tariff carload freight rate thereon from Pittsburgh shall be not greater than 33c. per 100 lb. prior to Oct. 1, 1933, 31c. per 100 lb. on and after said date, a deduction not exceeding an amount that shall be \$5 per net ton less than the all-rail published tariff carload freight charges otherwise chargeable thereon pursuant to the provisions of said Section 4 from the basing point on which such base price is based to such place of delivery.

Officers Named by Gas Association

HERBERT O. CASTER, member of the executive committee of Henry L. Doherty & Co., New York, was elected president of the American Gas Association at its international gas conference and fifteenth annual convention held Sept. 25 to 29 at Chicago. P. S. Young, Newark, N. J., vice-president of Public Service Electric & Gas Co., was elected vice-president of the association, and William J. Welsh, president, New York & Richmond Gas Co., Staten Island, N. Y., was elected treasurer.

The following were appointed to the executive board of the association for a two-year term: Walter C. Beckjord, vice-president and general manager, Boston Consolidated Gas Co.; Howard Bruce, chairman of the board, Bartlett-Hayward Co., Baltimore; J. S. Dellart, Jr., president, Isbell-Porter Co., Newark, N. J.; F. C. Freeman, president, Providence Gas Co., Providence, R. I.; R. W. Gallagher, president, East Ohio Gas Co., Cleveland; C. N. Lauer, president, Philadelphia Gas Works Co., Philadelphia; B. J. Mullaney, vice-president, Peoples Gas Light & Coke Co., Chicago, and Herman Russell, president, Rochester Gas & Electric Corp., Rochester, N. Y.

Deductions To Be Allowed From Freight Rates on Finished Steel Products for Shipment to Michigan (in dollars per ton)

For Delivery to	Alloy Steel Bars Hot-Rolled	Alloy Steel Bars Cold-Finished	Carbon Bars Hot-Rolled	Carbon Bars Cold-Finished	Blooms, Billets and Slabs, Alloy and Carbon	Sheets	Hot-Rolled Strip
Detroit	\$3	\$3	\$3	\$4	\$3	\$4	\$4
Michigan points taking a 29c. freight rate from Pittsburgh	4	..	4	..	4	..	..
Michigan points taking a 31c. freight rate from Pittsburgh .....	..	4	..	5	..	5	5

British Pig Iron Production Falls Behind Demand

LONDON, ENGLAND, Oct. 3 (By Cable).—Pig iron merchants, as well as consumers, are increasing their commitments, but some furnaces are unable to increase output, owing to shortage of fuel, while others are preparing to light idle stacks. Manufacturers of semi-finished steel are busy and some billet makers are refusing orders for delivery during the rest of the year.

Demand for finished steel is improving, with a freer flow of merchant orders. Tin plate is dull, though prices are generally maintained.

Overseas demand for Continental steel is broadening, but business with United Kingdom consumers is difficult. The Raw Steel Cartel is now discussing c.i.f. and f.o.b. prices and a fourth quarter program. The Continental tube and International tube cartels will meet in Paris, Oct. 11 to 13. Belgium has received its first Russian order, comprising 6000 tons of rolled steel, mainly sheets.

Under the Anglo-Argentine pact the Argentine Government agrees not to raise its import duty on British tin

plate. Other commodities, on which duties have been reduced, include unworked iron sheets, steel bars, steel strip and lead-coated iron sheets.

Whitehead Thomas Bar & Strip Co., Ltd., with capital of £100,000 has been formed to acquire the Redbourn Works and make rolled steel. L. D. Whitehead is deputy chairman and managing director. Sir W. J. Firth is first chairman.

Canadian Iron Output Best in Two Years

CANADIAN pig iron output in August, at 35,233 tons, was the highest since July, 1931, and compares with 31,689 tons in the previous month and 5,992 tons in August, 1932. Ferro-alloys production during August, at 1,796 tons, increased 42 per cent over July and 160 per cent over August, 1932.

Production of 48,659 tons of steel ingots and direct steel castings in Canada during August showed little change from the 49,076 tons reported for July. The August figure included 46,979 tons of ingots, all of which were made for the further use of the reporting firms, and 1,680 tons of castings, most of which were made for sale.

D. G. Roos Nominated to Head S. A. E.

DELMAR G. ROOS, chief engineer, Studebaker Corp., has been nominated for president of the Society of Automotive Engineers, for the year 1934. Mr. Roos has been in the automotive industry continuously since his graduation from Cornell University in 1911. He was connected with the Locomobile Co. of America until 1925 when he resigned to become chief engineer of the Marmon Motor Car Co. A year later he joined the Studebaker Corp. Mr. Roos has been active in the S.A.E. for many years, serving as vice-president of the passenger car activity in 1932, and at other times on several important committees.

Nominations for vice-president of the society's nine divisions are as follows: Aircraft, T. P. Wright, general manager, Curtiss Aeroplane & Motor Co.; Aircraft engineer, Robert Insley, research engineer, United Aircraft & Transport Corp.; Diesel engines, H. D. Hill, vice-president, Hill Diesel Engine Co.; fuels and lubricants, A. L. Clayden, research engineer, Sun Oil Co.; motor trucks and

motorcoaches, A. K. Brumbaugh, engineer, Graham-Paige Motors cars, F. F. Kishline, assistant chief engineer, Graham-Paige Motors Corp.; passenger car bodies, J. W. Votypka, chief engineer, Le Baron-Detroit Co.; production, W. H. McCoy, manager, experimental production machine shop, General Motors Corp.; and transportation and maintenance, L. V. Newton, automotive engineer, Bylesby Engineering & Management Corp.

Designing Machinery of Rolled Steel

DESIGN is perhaps the most important factor in the utilization of welded rolled steel in the manufacture of steel mill machinery, according to H. G. Marsh, Carnegie Steel Co., Pittsburgh, who delivered an address on the general subject of rolled steel construction at the annual convention of the International Acetylene Association in Chicago last week.

Welded construction must stand on its own feet, he said; in other words it must show a decrease in cost or an increase in value to the steel manufacturer in order to be adopted by him for his equipment and these advantages will be gained largely by intelligent designing.

Mr. Marsh emphasized that simply replacing cast steel or cast iron with rolled steel is not advantageous. It might result in some saving in weight at the expense of torsional strength but it would no doubt increase the cost, due to excessive welding. The design should utilize to the fullest extent the superior qualities of rolled steel as well as those of the method of fabrication.

This means the designer must know the fundamentals of welding and the danger of the resultant stresses; he must know more about casting and foundry practice than ever before in order to take every advantage of possible combinations of weldings and castings which will result in economy. He must give more thought to stress analysis, so that concentration of stresses can be avoided rather than overcome by crudely adding more metal. Above all, the designer will need imagination. Until designers become so versed in this new art, welded construction will not be used to the extent its qualities warrant.

JOSEPH T. RYERSON & SON, INC., Chicago, broke ground Oct. 1 on its one-story warehouse addition, 82 x 370 ft. and two-story office building, 106 x 134 ft. at Clinton and First streets, St. Louis. The new structure will cost \$100,000 and will increase facilities about 40 per cent. R. B. Wilson is manager of the St. Louis branch.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton			
Ferromanganese, export	£9		
Billets, open-hrth.	£5 5s.	to	£5 12s. 6d.
Black sheets, Japanese specifications	£11		
Tin plate, per base box	16s.	6d. to	17s.
Steel bars, open-hearth	£7 17½s.	to	£8 7½s.
Beams, open-hrth.	£7 7½s.	to	£7 17½s.
Channels, open-hearth	£7 12½s.	to	£8 2½s.
Angles, open-hearth	£7 7½s.	to	£7 17½s.
Black sheets, No. 24 gage	£9 5s.		
Galvanized sheets, No. 24 gage	£11 5s.	to	£11 15s.

Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £ at \$4.86			
*Ingots	£2 5s.		
*Billets, Thomas	£2 7s.		
Wire rods, No. 5 B.W.G.	£4 10s.		
Black sheets, No. 31 gage, Japanese	£11 5s.		
*Steel bars, merchant	£3		
*Sheet bars	£2 8s.		
Plates, ¼ in. and up	£3 18s. 6d.		
*Plates, ⅞ in. and 5 mm.	£4 1s.		
*Sheets, ¼ in.	£4 6s.		
*Ship plates	£4 10s.		
*Beams, Thomas	£2 16s. 6d.		
*Angles (basis)	£3		
Hoops and strip steel over 6-in. base	£3 15s.		
Wire, plain, No. 8	£5 7s. 6d.		
Wire nails	£5 16s.		
Wire, barbed 4-pt. No. 10 B.W.G.	£8 15s.		

*Prices as established by European Raw Steel Cartel.

PERSONALS

REV. JULIUS ARTHUR NIEUWLAND, professor of organic chemistry, University of Notre Dame, South Bend, Ind., was presented Sept. 27, at Chicago, with the Morehead medal which is awarded annually by the International Acetylene Association to the person who in the judgment of its officers and board of directors has done most to advance the industry or the art of producing or utilizing calcium carbide or its derivatives. In 1904 Rev. Nieuwland published a treatise on the subject of reactions of acetylene. In the intervening years he has continued his fundamental research in the chemistry of acetylene and his contributions to the industry have been of scientific and commercial importance.



REV. J. A. NIEUWLAND

HIRAM E. TODD, who for many years has been the legal counsel for and a director of the Keystone Steel & Wire Co., Peoria, Ill., has been elected president, succeeding W. H. SOMMER, who retains his post as chairman of the board. W. C. BUCHANAN, heretofore vice-president and assistant general manager, has been appointed vice-president and general manager in charge of Keystone and its subsidiaries. MRS. B. L. SOMMER, widow of a former president, has been elected a director to succeed C. W. LA PORTE, who has resigned.

DAVID FINDLAY, for many years general sales manager of the L. S. Starrett Co., Athol, Mass., has been elected vice-president in addition to serving as general sales manager.

OSCAR VOGL, until recently general merchandising director of the Pabst Corp., has been named general sales manager of the beer barrel division of

the Ingersoll Steel & Disc Co. He will specialize in the promotion of Krupp designed beer barrels, stainless steel and stainless clad steel tanks and other brewery equipment.

GEORGE W. WAGSTAFF, who has been identified with the alloy steel industry for about 20 years, has joined the alloy steel sales force of the Chicago office of the Youngstown Sheet & Tube Co.

R. L. FOOTE has been appointed head of the newly-created engineering service department of the Synthane Corp., Oaks, Pa., manufacturer of laminated plastic products.

COL. ROYAL MATTICE, president of the Mattice Engineering Co., has been elected president of the NRA Welding

Contractors' Association of Philadelphia and Camden.

A. CAMPBELL WHITE, who has been engaged in the sale of sheets in Texas territory for several years, has been appointed district sales manager in that district for the Eastern Rolling Mill Co., Baltimore.

CHARLES F. NORTON, formerly vice-president and general manager of the Howell Electric Motors Co., has become identified with the Louis Allis Co., Milwaukee, in an executive sales capacity.

S. R. WILLOCK has been made Pittsburgh district sales manager of the Treadwell Engineering Co., Easton, Pa. He has had considerable experience in the rolling mill equipment industry, having been previously identified with the Mesta Machine Co., United Engineering & Foundry Co., Mackintosh-Hemphill Co., and the Wellman Engineering Co.

DR. VINCENZO VENTAFRIDA, director of the furnace plant of Acciaierie e Ferriere Lombarde Falck, Dongo, Como, Italy, and Dr. Quinto Chiesa, director-general, Cantieri Metallurgici Italiani, Castellammare di Stabia, Italy, are spending October in the United States to visit tin plate, sheet, pipe, and bolt and nut plants and the like.

CHARLES P. PERIN, president, Perin Engineering Co., New York, returned Sept. 27 from Europe.

ROBERT B. SCHENCK has become associated with the Pittsburgh Crucible Steel Co., as a metallurgical engineer located in its Detroit district sales office. He was for many years head of the metallurgical department of the Buick Motor Co. at Flint, Mich.

D. W. LAWLER, 1911 Rutherford Avenue, Louisville, Ky., has been appointed exclusive representative in the Louisville district for the sale of Hypressure Jenny, a vapor spray machine used for automotive, industrial, aeronautical and building cleaning, made by the Homestead Valve Mfg. Co., Coraopolis, Pa.

MAXWELL SPIRO, Maxwell Spiro & Co., Jersey City, N. J., was elected president of the Structural Steel and Ornamental Iron Association of the State of New Jersey at a recent meeting. Other officers are HYMAN BREEN, Breen Iron Works, Newark, vice-president; GEORGE BRUNQUELL, Brunquell Iron Works, Jersey City, treasurer, and HARRY KATCHEN, B. Katchen Iron Works, Newark, secretary.

C. A. BAUMHAUER, formerly president of the Phoenix Brass Foundry & Machine Works, Mobile, has been elected a commissioner of that city.



B. E. Kibbee, who, as announced in these columns Sept. 14, has been appointed executive vice-president of the Sharon Steel Hoop Co. J. Milton Hughes, new vice-president in charge of operations, and Thomas M. Galbreath, general manager of sales. (Reading left to right.)

Machine Tool Code Gets Public Hearing

WASHINGTON, Oct. 2. — The code of fair competition proposed for the machine tool industry was given a public hearing Monday, under the direction of Deputy Administrator Malcolm Muir. The hearing occupied less than two hours, most of the evidence being submitted in the form of written briefs for later consideration by the administrator, advisory boards and the committee for the industry.

R. E. Flanders, president, Jones and Lamson Co., Springfield, Vt., read the letter of transmittal in which the peculiarities of the industries were outlined. Attention was called to the extreme cyclical fluctuations which characterize the machine tool building business, the almost complete drying up of the export reservoir which hitherto has mitigated depressions in the industry and predominating characteristic of owner management which has developed close cooperation between employers and employees. The location of many of the machine tool building companies in the smaller communities was emphasized and attention called to the policy which has prevailed of community service through maintenance of depression employment by development of new designs.

John W. O'Leary, president of the Machinery and Allied Products Institute, with which the National Machine Tool Builders' Association is affiliated, endorsed the proposed machine tool code as being in conformity with the general code provisions of the MAPI. Mr. O'Leary also called attention to the fact that the greatest amount of depression unemployment was to be found in the "durable" or capital goods category. In 1929, he stated, durable goods represented a national volume of approximately 40 billion dollars, compared with 30 billion dollars of consumer goods. In 1932 there had been a decline of 32 per cent in consumer goods volume as compared with a decline of 80 per cent in durable goods. Thus, Mr. O'Leary pointed out, the great opportunity for reemployment of idle labor is in the durable goods field.

The necessity of an expansion of long term credits was also stressed by Mr. O'Leary. Durable goods are paid for by savings, not income, and require long term credits for this purpose. As an illustration of the drying up of the flow of capital in the form of long term credits for the purchase of capital equipment, Mr. O'Leary gave an estimate of \$250,000,000 to be provided for this purpose during 1933, as contrasted with \$8,000,000,000 in 1929.

Too high hourly wages, or too short a working week, said Mr. O'Leary,

will jeopardize reemployment in the durable goods industries by resulting in prohibitive costs.

In the detailed discussion of articles of the proposed code, no public mention was made of the "merit" clause which is included. Undoubtedly, however, objection to it was filed in one of the labor briefs submitted and undoubtedly, too, it will be attacked by the Labor Advisory Board. A canvass of opinion of influential members of the industry who were present at the hearing indicated that there may be considerable opposition, on the part of the industry, to a request for the removal of this clause.

Information was requested by the administrator as to the probable number to be reemployed under the proposed code working hour schedule, and also as to the comparison of hours and wages prevailing in the industry in 1929 and at present. Data on these points will be submitted.

The Consumer Advisory Board requested the elimination of paragraphs 2, 3 and 4 of Section XIV. These relate to changes in published prices. (See THE IRON AGE, Aug. 31, p. 27H. Complete Machine Tool Code as submitted.)

In concluding the public hearing, Administrator Muir complimented the machine tool industry upon both the spirit and the intelligence of its cooperation with the administration. It was one of the first of the industries, he said, to concentrate its activities upon the task of preparing a practical working program under the terms of N.R.A.

Eaton-Detroit Metal Co. Is Formed by Merger

The Eaton-Detroit Metal Co., Detroit, has been formed through a merger of the Detroit Metal Specialties Co. and the Easy-On Cap division of the Eaton Mfg. Co. Controlling interest in the new company, incorporated in Ohio with assets of about \$750,000, will be held by the Eaton Mfg. Co. The company will have its main office in conjunction with the Detroit offices of the Eaton company. The Detroit Metal Specialties Co. manufactures deep drawn stampings, automobile trunks and stove fittings, while the Easy-on Cap division of the Eaton company makes caps for gasoline tanks, radiators and for other purposes. Operations will be continued at the Detroit and Cleveland plants.

J. O. Eaton will be chairman of the board of the new company and W. C. Ireland, former president of the De-

troit Metal Specialties Co., will be president. Daniel Dewey will be vice-president and F. A. Buchda, secretary and treasurer.

Officers for Steel Treaters Named

DETROIT, Oct. 3.—At the annual meeting of delegates from the local chapters of the American Society for Steel Treating during the National Metal Congress at the Hotel Statler, the following nominations were made for officers for 1934: President W. H. Phillips, Molybdenum Corp. of America, Pittsburgh; vice-president, B. F. Shepherd, Ingersoll-Rand Co., Phillipsburgh, N. J.; treasurer (for reelection) A. T. Clarage, Columbia Tool Steel Co., Chicago Heights, Ill.; directors for two years, E. C. Bain, research laboratory, United States Steel Corp., Kearney, N. J., and W. P. Woodside, research director, Climax Molybdenum Co., Detroit.

These men will take office Jan. 1, 1934. The secretary, W. H. Eisenman, was elected for two years last year.

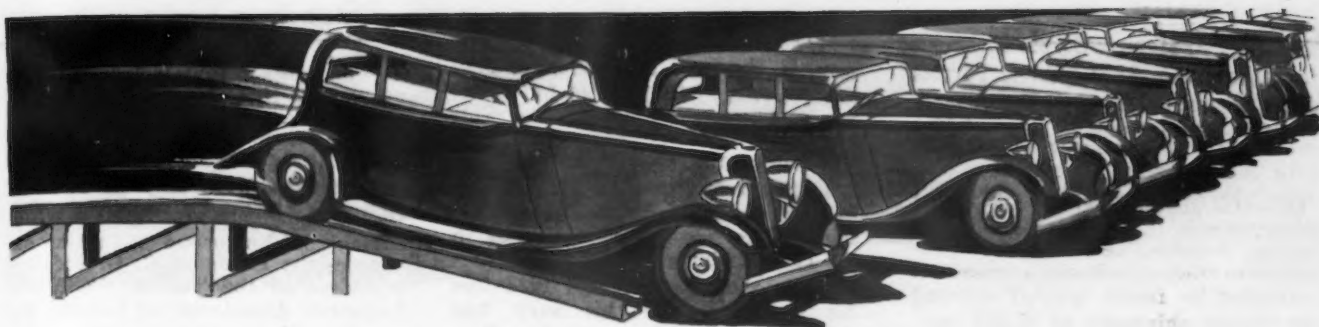
Sessions of the American Welding Society at the Book-Cadillac opened with a large attendance.

Sheets & Tubes Alloy Department Completed

YOUNGSTOWN SHEET & TUBE CO., Youngstown, Ohio, has authorized improvements to its Indiana Harbor, Ind., plant at an estimated cost of \$250,000. The company has announced that its new alloy department is now equipped to produce this product. Extensions will be made to the storage and shipping facilities of the bar and billet mills to facilitate the handling of alloy business. The company will also add a new unit for the manufacture of railroad tie plates, a department which was recently established.

Used Machinery Dealers Organizing

A MEETING of the National Institute of Used Machinery Dealers was held in Cleveland, Sept. 30, to discuss plans for completing its organization, adding to its membership and adopting a code. Charles Simmons, Simmons Machinery Co., Albany, N. Y., the temporary president, presided. Efforts will be made to form chapters of the Institute in various centers not yet represented in the organization. Another meeting is planned to be held in Chicago in about three weeks.



▲ ▲ ▲ THIS WEEK ON THE ASSEMBLY LINE ▲ ▲ ▲

Large Steel Users in Last-Minute Rush To Place Orders at Old Prices

DETROIT, Oct. 3.

A LAST-MINUTE rush of steel users to specify as much tonnage as possible at old prices, particularly of carbon steel bars, coupled with the confusion arising from newly-issued interpretations of the steel code, kept local steel offices working overtime the past week.

Chrysler, giving releases for bars for 20,000 cars, and Chevrolet were among the buyers who hastened to take advantage of prices prior to the increase on Oct. 1. Buick placed orders for steel covering about a month's requirements. Ford also bought some steel, but was reported to have been unsuccessful in trying to purchase a large quantity at the third quarter schedule.

If all steel consumers had been as adroit in wording their steel contracts as Chrysler, they could have taken out almost an unlimited tonnage. The Chrysler steel contract allotted to each mill participating in its business "a portion" of its quarter's needs. This was sufficiently elastic to cover any tonnage, large or small. Of course, this type of agreement is now prohibited by the code.

Heretofore the important automobile companies have put out inquiries for steel prices well in advance of the beginning of a quarter. This action was notably absent the past month. With uniform prices ruling on all steel products, the incentive for seeking bids on steel is removed. So far as the award of contracts for the final quarter is concerned, neither Chevrolet nor Chrysler has been in a hurry, preferring to wait until some of the kinks in the steel code are ironed out. However, it is believed that few, if any, changes will be made in the sources of supply of these two com-

panies. Chrysler is now engaged in the task of placing its contracts.

Automobile Output Off

Motor car output has slipped somewhat in the last 10 days, but the decline has been so gradual as to cause no misgivings. Retail sales of practically all makers were maintained far above those in the same month of last year, justifying production during the month of about 185,000 units. Incidentally, September was the first month since April in which assemblies did not exceed 200,000 units. Although retail deliveries are expected to taper during the fall season, no precipitate drop is anticipated. The industry's output in October is tentatively estimated at 145,000 units.

Ford's rate of manufacture at Rouge is believed to have fallen off in the final days of September, with assemblies for the month put at 40,000 to 45,000 cars. October probably will bring a further decline as the effects of seasonal slackening in retail sales are noticed. General Motors' car divisions will go down at various times this month to take inventory and to change over their production equipment for 1934 models. The local gear and axle and forge plants of the Chevrolet company will be idle only two weeks, but it is said that Buick and Oldsmobile will suspend production for about a month. Chrysler's divisions will operate without interruption throughout October, although schedules will not be so high as in the past month. Some of the castings makers supplying Chrysler have not yet received any releases for October.

Truck Maker Becomes Self-Contained

International Harvester's expansion in the light truck field through the

manufacture of its half-ton unit in its own plant has aroused interest in the automotive trade. Ever since it introduced this unit, it has had the chassis made by the Willys-Overland company at Toledo, but now it is drawing all this work into its own factories, including the building of the motor. Some of the work will be carried on at Moline, Ill., as well as at Fort Wayne, Ind., and Springfield, Ohio. Willys-Overland has manufactured 17,000 trucks for the International company, meeting overhead and other expenses, but making no profit on the contract.

Moving another step toward becoming self-contained, a prominent motor car company has decided to establish its own spring-making department and the past week placed machinery and equipment orders totaling about \$250,000 for this new division. It expects to have the department ready to turn out springs when its 1934 line starts production.

The new arbitrary delivered prices of sheets at Detroit and cities nearby do not apply to vitreous enameled or galvanized sheets or terne plate, but only to hot-rolled and cold-rolled sheets, which are the grades used in the automobile industry.

Detroit Notes

The story is heard in automotive circles that a group of automotive parts manufacturers, with perhaps the assistance of a truck maker, is considering the building of a small four-cylinder car in the old Durant plant at Lansing, recently acquired at auction by R. E. Olds, veteran automobile capitalist. . . . Studebaker, filling dealers' requirements for its new models, is a beehive of activity at South Bend. Nash, about ready to introduce

a new series, also has increased production. . . . Murray Corp. continues to make about 1500 quarter barrels daily for the brewing industry. . . . At least one division of General Motors is said to be preparing to fabricate rustless steel parts in its own plant next year instead of buying the parts outside. . . . The automobile industry, including shippers of passenger cars, trucks, tires and accessories, estimates its fourth quarter railroad car freight shipments at 35,388 cars, compared with 26,510 cars used in the same period of 1932, a gain of 33.5 per cent, according to a report submitted to the Great Lakes Regional Advisory Board. . . . Machine tool sales at Detroit the past week were the largest in many weeks. . . . The tubular frame is a possibility for the 1934 cars of one important company, but whether it will be adopted is not yet known.

After having announced that it would operate 32 hr. a week for the present, the Ford Motor Co. has suddenly switched back to 40 hr. It is reported that the reason for this change in plans is the conviction of the Ford management that its workers cannot earn sufficient wages 32 hr. a week to take care of their families in view of recent increases in the cost of living.

Studebaker, showing its 1934 line for the first time this week, has dropped the Rockne name and is offering a Studebaker six at \$645 and two eights at \$845 and \$1,045. Bodies show a greater trend toward streamlining, with rear fenders approaching the form of streamline valances seen on modern high-speed aircraft. The motor is more powerful and has an aluminum head and pistons. The two eights have box frames. Factory shipments in October may exceed 10,000 units.

Tool and Die Makers Strike Hampers Progress on New Models at Detroit

DETROIT, Oct. 3.—After taking a three-day ballot among its Detroit membership, the Mechanics Educational Society, consisting of tool and die makers, issued a strike call last Tuesday noon to support the members of the society already on strike at Flint. The strike spread rapidly here and, although it is difficult to obtain an accurate check, the strike committee claims that 43 firms are affected. These include practically all the automobile companies as well as independent tool and die shops. Strike leaders declare that 10,000 men have answered the strike call. This figure is disputed by spokesmen for the employers, who state that the number of men out has been grossly exaggerated.

Concurrently with the action of the Mechanics Educational Society, which is not affiliated with the American Federation of Labor, is a strike of approximately 2000 employees of the Murray Corp. of America under the leadership of the Industrial Workers of the World (I.W.W.). This strike likewise does not have the support of the Federation, which is maintaining a "hands-off" policy.

For the first three days of the tool and die makers' strike the managements of the companies affected were left in the dark regarding the objectives of the men, aside from the fact that they were expressing support for their members who previously had walked out at the Buick Motor Co., Chevrolet Motor Co. and AC Spark Plug Co. in Flint. However, the strike committee finally formulated a set of demands as follows: (1) a wage increase of 25 per cent in tool and die shops in the Detroit, Pontiac and Flint districts, bringing the minimum

wage to \$1 an hour for benchmen and 90c. for affiliated machinists; (2) any change of employment which would mean work in excess of 40 hours a week to be negotiated with a workers' committee and settled so far as possible to give the greatest number of men employment; (3) no penalizing of workers who struck; and (4) no work Saturdays, Sundays or legal holidays.

It was suggested that negotiations to end the strike at Flint, Pontiac and Detroit be conducted by John M. Carmody, representative of the National Labor Board, in conjunction with the Detroit NRA Compliance Board and that a single settlement be made for all three cities. The strike committee, urging this action, pointed out that the automobile code in the matter of hours and wages treats Flint, Pontiac and Detroit as one unit. However, employers at Flint and Pontiac objected, because their problems in connection with the strike differed from those of Detroit employers. In those two cities the strike is solely concerned with car manufacturing divisions of General Motors Corp., whereas in Detroit independent shops as well as motor car companies are affected. The automobile companies contend that any settlement should have as its basis the automobile code under which they are now operating.

Discussing the strike, Chester M. Culver, manager of the Employers' Association of Detroit, stated that "every day of delay means another day's delay in the manufacture of new models. The production men will be the real sufferers. There is a slack period between the end of the manufacture of the old and the starting of

new models. This period will be extended due to the action of this group." Mr. Carmody, in offering the services of the National Labor Board and urging a speedy solution of the trouble, made the comment that "if the strike continues your (tool and die makers) work may go to other cities."

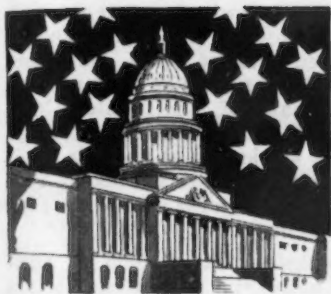
Negotiations to end the strike are now in the hands of C. C. Richard, president of the Tool & Die Manufacturers' Association of Detroit, and N. W. Woodworth, president Excel-O Aircraft & Tool Corp., representing the employers, a committee from the Mechanics Educational Society, and Mr. Carmody representing the federal government.

Strikers at the Murray Corp. are demanding the recognition of the Metal & Machinery Workers Industrial Union No. 440 of the I.W.W. as the agency for collective bargaining of employees with the company and that departmental grievance committees be elected by employees for adjustment of disputes with the company. The local NRA Compliance Board has offered to mediate, but the company has declared that at present it does not care to employ the board's services.

Alarmed at the growth of strikes in the Detroit district, the local NRA Compliance Board the past week issued an appeal to both employers and employees to use the agencies which have been set up to arrive at peaceful solutions of disputes, emphasizing that "strikes and lockouts are not only wasteful, not only do they engender bitterness on both sides and make the task of conciliation and compromise increasingly difficult, but they are no longer necessary to either party in the protection of his rights." The statement, signed by all members of the board, added that "through hastily conceived and ill-advised action, the whole NRA program of natural recovery is threatened with disaster."

While the local strikes are in progress, the American Federation of Labor, holding aloof from them, is continuing its task of unionizing the automobile industry. William Collins, in command of the Federation drive, publicly states that his organization is not promoting strikes and does not believe that strikes are desirable at this time. The Federation has granted charters to 20 locals of the United Auto Workers Union in Detroit, Toledo, Pontiac, Flint and Lansing.

A tabulation of the properties of die cast Zamak alloys has been printed for general distribution by the New Jersey Zinc Co., 160 Front Street, New York. For each of four compositions are listed the physical characteristics that point to various applications in die castings requiring strength and wear, including machinery parts.



▲ ▲ ▲ THIS WEEK IN WASHINGTON ▲ ▲ ▲

Administration Makes Desperate Moves for Industrial Peace as Strikes Imperil Progress

WASHINGTON, Oct. 3.—Spreading like a prairie fire, labor strikes are gravely threatening the NRA. The Roosevelt Administration is moving desperately to save the Recovery program from disruption just at the time that it should be getting under full steam.

This phase of its work, much more difficult than codification, perplexing as that has been, took on an added load yesterday when the bituminous coal industry started operation under a code. The great bulk of the industries representing potential employment and purchasing power, two outstanding objectives of the Recovery program, now are definitely under the code system. It was the original conception of the NRA that, once it had gathered the basic industries in its fold, others would readily follow and successful achievement of the program would be accomplished. Sixty days had been given as the period to determine the failure or success of the program. It had been expected to have all industries codified by Sept. 1.

Industrial Peace Is Crucial

These expectations have not materialized. Nor has the NRA during its life of 108 days come to the grievous end that had been predicted in the event that its hopes were not realized in the time allotted. It is only stating the obvious, however, to say that reaction against it is growing over the country because it has fallen far short of the predictions of its sponsors. The growing labor troubles have, of course, stimulated skepticism toward the program and given it a serious blow. By many it is believed that unless strikes are quickly brought to an end and industrial peace established, the Recovery program is doomed.

It is clear that the Roosevelt admin-

By L. W. MOFFETT

Resident Washington Editor, The Iron Age

istration is greatly disturbed, and is making strenuous and admirable efforts to save the situation.

The most ominous strikes have occurred in the western Pennsylvania coal fields, both in "captive mines," some owned by steel companies, and in independent mines. Except for a small contingent, all independent mines have signed contracts with the United Mine Workers of America, and this is generally construed as recognition of the union. "Captive" mines come under the code, no matter whether they have signed it or have made agreements with labor. But organized labor, feeling its power under the Recovery act, has agitated strikes in an effort to force recognition by the captive mines. The agreement, of the owners of captive mines with President Roosevelt, announced from Hyde Park last week, did not have the hoped-for result of returning miners to work or of checking and preventing strikes that have now reached steel mills and have also penetrated the automotive industry.

General Johnson's Appeal

Hence the hasty summons by General Hugh S. Johnson to Walter Reed hospital last Saturday of steel executives, automobile executives and officials of the American Federation of Labor.

Convalescing from a minor operation, General Johnson appealed for the help of both the executives and organized labor to do all they can to restore peace. Walter P. Chrysler was asked to investigate the strike situation in the automotive field and has agreed to

give it quick study and to do what he can to settle disputes. The steel executives apparently were called in because of strikes at captive mines which their organizations operate and on which they normally rely to operate their plants. These executives were Myron C. Taylor, chairman of the United States Steel Corp.; E. G. Grace, president of the Bethlehem Steel Corp., and former Gov. Nathan L. Miller, counsel for the American Iron and Steel Institute.

The Steel Industry's Attitude

Calling newspaper correspondents after the conferences, General Johnson said that the steel executives had refused to give formal recognition to the union. He did not say whether he had directly asked that such recognition be given. The General agreed that the issue with the steel executives concerned coal mines only slightly. From this it was inferred that the pressure for union recognition by the captive mines was seen as part of a broad effort on the part of organized labor to unionize the entire iron and steel industry, as well as all other important open-shop industries.

President William Green of the American Federation of Labor has said plainly this is the goal of his organization and its convention now under way in Washington reflects a similar purpose.

General Johnson conceded that it is beyond his power to require an agreement from any employer or labor group, but maintained his position that the Government must uphold literal interpretation of Section 7A of the Recovery act guaranteeing employees the right of collective bargaining through representatives of their own choosing. Steel manufacturers insist that employees now are given

this right through employee representation and are determined to prevent outside interference from organized labor.

The steel executives refused to commit themselves to any definite understanding with General Johnson as to the strike situation until after they had conferred with other members of the American Iron and Steel Institute in New York.

Mr. Green's Position

After the conference with Mr. Green, held prior to the one held with steel executives, the head of the American Federation of Labor issued a statement that contained a note characterized by both conciliation and belligerency. He appealed to members of the federation for patience until the recovery program develops fully and asked dissatisfied workers to arbitrate, a suggestion which it is supposed General Johnson had made to steel executives and to organized labor. In his appeal to arbitrate, Mr. Green called attention to the fact that the National Labor Board, headed by Senator Robert F. Wagner of New York, is attempting to settle employer-employee disputes, and that to this end also State and local boards are being set up fast. Next, Mr. Green turned to a forceful tone, declaring that if there is failure to secure redress through these agencies "the right to strike certainly remains open as an instrument of last resort."

Mr. Green's position is not a simple one politically. With the annual convention of the federation in session, he faces vigorous opposition from important wings of the organization. Some oppose him on the ground that he is not aggressive enough. Opposition comes also from some of the craft unions, which are making a lively stir over the recurring subject of jurisdiction. It is maintained by these groups that, in its remarkably successful campaign of enlisting membership under the aegis of the Recovery act, the American Federation of Labor has taken in large numbers of members in Federal unions, rather than under craft unions, naturally to the extreme dislike of the latter.

Mr. Green's leadership is said to be at stake. He wants to go along with the Recovery Administration, likewise natural in view of the strength organized labor has been given by the act under which the Administration operates. He does not want the federation to get the ill will of the public. Such ill will is already mounting, though tempered somewhat by ill will that also is growing against sweatshop industries which are seeking to reduce rather than increase wages under the Recovery Act, and even to make working conditions more nearly intolerable. This is a factor that is hurting legitimate industry as a whole, which is being forced to take unjustified blame by some observers who are misguided but well-meaning.

Mr. Green likewise does not want to lose affiliation with the more "aggressive" groups in his organization. Yet he does not want to give way entirely to them. For that would mean loss of support from the more moderate group.

It is believed that Mr. Green personally is convinced that both common sense and good labor politics dictate the necessity of keeping peace in the industrial world at the present trying period, and that successful adherence to such a policy would greatly enhance the standing of his organization in the estimation of both the NRA and the public. Yet he realizes perhaps, so it is thought, that if he follows too conservative a course, radical labor groups will gain in strength, set off strikes in a growing scale and wrest leadership away from the American Federation of Labor. Dangers of such a development have sufficient precedents, an example of which was the steel strike of 1919.

So finding himself between Scylla and Charybdis, Mr. Green apparently feels he cannot go too conservative, nor yet too radical. Which might explain the tone of his appeal to organ-

ized labor following conference with General Johnson. Its tone too might have been affected by a conference General Johnson had on the same day with officials of the United Mine Workers. While most of the latter are not what are known as radicals, their leaders are of a more aggressive type than Mr. Green, in the view of the rank and file of organized labor.

Nevertheless, Mr. Green is sufficiently active in advocating certain "aggressive" policies, one of which is the 30-hr., five-day week, which he says he will ask for again at the next Congress. He concedes that the Recovery program has done a great deal for organized labor, but contends that it has fallen far short of what it should do. And unless wages are raised higher and work hours shortened, he states, the Recovery program will not succeed.

Industry generally takes a decidedly different and determined stand. Its position is that it is now threatened in many cases with ruin by reason of increased wages and costs because of the codes and that to ask it to do more simply is to ask the impossible.

Coal Strike Believed Ended by Settling "Captive" Mine Issue

FOLLOWING the signing by President Roosevelt of an agreement with steel companies operating coal properties Sept. 29, further pressure was brought to bear by the NRA on Oct. 2 in an effort to end the strike of 100,000 miners in southwestern Pennsylvania. At the insistence of General Johnson, Thomas Moses, president of the H. C. Frick Coke Co., acting for the mine owners, and Philip Murray, vice-president of the United Mine Workers of America, came to an understanding at Pittsburgh, which is expected to end the strike. While the steel companies owning mines did not sign a definite agreement with the United Mine Workers, and thus maintained their position of refusing to recognize the union, they agreed to the principles laid down in the coal code with regard to working hours and rates of pay.

The text of the earlier agreement between the "captive" mine owners and the President follows:

The undersigned (hereinafter sometimes called the employers) are members of the Code of Fair Competition of the Iron and Steel Industry approved by the President of the United States, Aug. 19, 1933 (hereinafter called the steel code), or are subsidiary or affiliated companies of such members.

Such members of the steel code or their said subsidiary or affiliated companies own and operate mines of bituminous coal for the production of such coal for the use of

the employers or their subsidiary or affiliated companies in operations in or related to the iron and steel industry.

The President of the United States on Sept. 18, 1933, approved a Code of Fair Competition for the Bituminous Coal Industry (hereinafter called the coal code).

The employers desire to cooperate with the President and the National Recovery Administration in order to effectuate the policy of Title I of the National Industrial Recovery Act and to that end hereby agree with the President and between and among each other as follows:

Each employer in the operation of any bituminous coal mine operated by it will comply with the maximum hours of labor and minimum rates of pay which are or shall be prescribed under or pursuant to the coal code for the district in which such mine is located so long as the coal code shall remain in effect.

This agreement is entered into pursuant to Section 4 (a) of the National Industrial Recovery Act as approved by the President June 16, 1933, and subject to all the terms and conditions required by Section 7 (a) and Section 10 (b) of said act.

In witness whereof, the employers have caused this agreement to be signed in their respective corporate names by their respective officers or representatives thereunto duly authorized, and the President of the United States has endorsed his approval hereon.

Approved:

With the understanding that under this agreement hours, wages and working conditions throughout these mines will be

made as favorable to the employees as those prevailing in the district in which such mines are located.

Signers of the Agreement

The agreement was signed by the following companies:

Republic Steel Corp., by T. M. Girdler, president.

Inland Steel Co., by L. E. Block, chairman.

Jones & Laughlin Steel Corp., by George G. Crawford, president.

Wheeling Steel Corp., by W. W. Holloway, president.

Crucible Steel Co. of America, by F. B. Hufnagel, president.

Interlake Iron Corp., by C. D. Caldwell, president.

Mather Collieries, by Pickands Mather & Co., operators.

Pittsburgh Steel Co., by H. D. Williams, president.

Corrigan McKinney Steel Co., by Donald B. Gillies.

Youngstown Sheet & Tube Co., by H. G. Dalton, chairman.

Columbia Steel Co., by W. J. Filbert, director.

Gulf States Steel Co., by L. E. Geohegan, vice-president and general manager.

H. C. Frick Coke Co., National Mining Co., Hostetter Connellsville Coke Co., Sharon Coal & Limestone Co., United States Coal & Coke Co., United States Fuel Co., by Thomas Moses, president.

Tennessee Coal, Iron & Railroad Co., by W. J. Filbert, director.

Bethlehem Mines Corp., by E. G. Grace.

Weirton Coal Co., by E. T. Weir, chairman.

General Johnson's Request

General Johnson's telegram to Mr. Murray, which resulted in the apparent settlement of the difficulties, follows:

"On Saturday afternoon Eugene Grace, Myron Taylor and Nathan Miller, representing owners of the captive mines, agreed to have Thomas Moses, president of the H. C. Frick Coke Co., meet with you and discuss all matters affecting the workers in the captive mines.

"As a result of your conference, I am advised Mr. Moses has handed you a letter, addressed to you in your official capacity as vice-president of the United Mine Workers of America, confirming the acceptance of the coal code through agreement with the President on the twenty-ninth day of September and agreeing to maintain working conditions, wages and hours as prevailing under agreements between other operators and the United Mine Workers of America in the several districts where mines are located.

"I am telegraphing you with the authority of the President of the United States urging that the United Mine Workers of America and its membership accept this settlement to become effective forthwith and the mines to immediately resume operations. This request is made in the national interest and I trust that each affected member of your organization will contribute his part to the necessity of an immediate resumption of work.

"They are advised that under the provisions of the bituminous coal code, the men will have the right of appeal for the protection of their interests to the National Bituminous Labor Board and the administrator of the National Industrial Recovery Act."

Punctuation Mark Ends Dispute in Hearing on Steel Boiler Code

WASHINGTON, Oct. 3.—A semicolon ended what promised to be a lengthy discussion over the code of fair competition for the steel tubular and firebox boiler industry. Discovery by William A. Nevin of the Industrial Advisory Board of this punctuation mark in a disputed section defining covering boilers overcame objections raised at a hearing on the code last Thursday. The definitions quoted from types of boilers referred to under a section of the boiler code of the American Society of Mechanical Engineers. James D. Andrews, representing the American Boiler Makers Association Committee on Industrial Recovery had engaged in a discussion with R. A. Locke, manager of the Steel Heating Boiler Institute, sponsor of the tubular and firebox boiler code, Assistant Deputy Administrator George S. Brady, and others regarding the possible application of this definition to manufacture under the previously presented code of the A. B. M. A. Discovery of the semi-colon made it clear that there was no conflict.

The code, presented by Mr. Locke, provides for a maximum work week of 40 hr., averaged over seasonal periods and calls for minimum wages of 35c. an hour in the North and 30c. in the South. The code also contains the much discussed "merit clause," together with a section that "no provisions within this code shall be interpreted as conflicting in any manner with the constitutional rights of any employee or employer." Mr. Locke said it was felt by proponents of the code that the rights of employers should be confirmed inasmuch as the rights of employees were set forth.

J. N. Davis, representing the International Brotherhood of Boilermakers, Iron Shipbuilders and Helpers, said that unless labor provisions in all codes submitted for the industry were identical great confusion would result. Deputy Brady asked Mr. Locke as to the reason for the lower wage rate specified in the code after seeming agreement had been reached in a conference with representatives of the boiler manufacturing industry for inclusion of higher rates established for the remainder of the industry. Mr. Locke said labor on steel boilers is approximately twice that called for by competitive equipment and that any undue increase in labor costs would make it impossible for his branch of the industry to maintain a proportionate share of the small volume of business now available.

Mr. Andrews requested that the code be held in abeyance until its wage

and hour provisions could be made to conform to those in the boiler manufacturing industry code. He declared that "otherwise the boiler manufacturers will withdraw until one satisfactory code for the entire industry is formulated." At the request of Deputy Brady the Code Committee conferred with the labor advisor regarding a satisfactory wage and hour section and with other departments of the NRA in an effort to reach agreement upon a code agreeable to all interests, if possible.

Separate Pipe Nipple Code Opposed

Differences of view as to whether the pipe nipple manufacturing industry should come under the code for the valve and fittings industry rather than its own code developed at the hearing on the latter before Assistant Deputy Administrator William Lawson. Terms of the proposed pipe nipple code are at present substantially the same as those of the valve and fittings code, with a 40-hr. maximum work week to consist of five days of 8 hr. each and a wage rate of 40c. per hour.

Pipe nipple makers contended that to come under the code of the Valve and Fittings Institute would subject them to too great an expense for their pro rata share of the cost of the code administration. It was also contended it would give the large concerns, as represented by the valve and fittings makers, control over the smaller interests who simply manufacture pipe nipples. There was a wide divergence of opinion as to the proportion of the total number of pipe nipples manufactured by the members of the Valve and Fittings Institute and that made by the pipe nipple manufacturers who submitted the separate code. Opposition to a separate code was expressed by Sam G. Moyers, representing George V. Denny, president of the Valve and Fittings Institute.

The pipe nipple code was presented by J. Lester Williams, president of the National Association of Pipe Nipple Manufacturers. Robert B. Shoe, president of the Shoe Letcher Co., Jersey City, N. J., and secretary of the National association, questioned the authority of Mr. Moyers to speak for the institute but Mr. Lawson pointed out that the Deputy Administrator has authority to call any witness he desires.

Hearing on Metal Tank Code

Hearings will be held in the Carlton Hotel on Friday of the present week on the code of fair competition for the metal tank industry filed by the National Steel Tank Association, claiming

to represent 83 per cent of the industry. Deputy Administrator Malcolm Muir will preside.

The code proposes a basic maximum week for factory employees of 40 hr., and not more than 8 hr. in any one day, provided that during periods of emergency employees may be permitted to work 48 hr. in not more than six weeks in any six months. The average is not to be more than 40 hr. per week, with a tolerance of 10 per cent for maintenance crews. The limitation as to hours exempts some classes, such as executives receiving more than \$35 per week and highly skilled workers, in special cases, on continuous processes. The minimum wage for factory employees is 40c. an hour except in States south of Maryland, West Virginia and Kentucky and east of the Mississippi River, where the rate is 32c.

Hearing on the code of fair competition for the shovel, dragline and crane industry was held last Friday before Assistant Deputy Administrator Brady and lasted one hour. The code was presented by L. E. Houston of the Northwestern Engineering Co., Chicago, chairman of the code committee, who said that the industry is willing to make sacrifices to carry out the purposes of the NRA. The code provides an average maximum 40-hr. week and minimum pay of 35c. an hour. Maximum hours of 30 a week were asked by R. S. Newham, Metal Trades Department, American Federation of Labor, with a minimum wage of \$16 per week.

Mr. Houston said production has declined from 89 per cent of capacity in 1929 to 13 per cent at present, while operation at 50 per cent was said to be necessary to meet all costs. That was about the 1931 rate, it was stated, employment in that year being nearly 6000 workers compared with 3500 at present. Inauguration of the code wages and hours, it was stated, will mean a 22 per cent increase in employment and 16 per cent in wages for common labor. Mr. Houston said that tremendous losses had been universal in the industry during the past two years and that capital investment had declined more than \$12,000,000.

T. M. Deal, president and general manager, Speeder Machinery Corp., Cedar Rapids, Ia., objected to certain fair practice divisions, particularly the limitation of cash discounts. He was asked to confer with the code committee and work out a solution.

W. W. Coleman, Bucyrus Erie Co., Milwaukee, was industrial advisor, and Fred Hewitt, editor of the *Machinist's Monthly Journal*, was labor advisor at the hearing.

American Smelting & Refining Co. had net earnings of over \$2,000,000 for six months ending June 30, as compared with a loss of over \$3,000,000 for the corresponding period of 1932.

Columbia River Power Job Gets Week's Largest Public Works Allotment

WASHINGTON, Oct. 3.—The largest allotment made last week by the Public Works Administration was \$20,000,000 for the construction of a dam and six power units at Bonnaville, Ore., on the Columbia River. The total cost of the development which will include power, navigation and flood control will be \$31,000,000.

Numerous other projects, which will also call for large quantities of steel and machinery, were also allotted. Approval was given to a tentative allocation of \$1,290,000 to the Hillcreek Homes Corp., for a low-cost housing project in Philadelphia. Included in non-Federal allotments to 14 projects in 11 States, aggregating \$2,195,100, was one of \$1,650,000 to the South Omaha Bridge Association, South Omaha, Neb., to construct a toll bridge across the Missouri River between that town and Council Bluffs, Iowa. Two other allotments in this list included one of \$167,000 to Albert Lea, Minn., for repaving streets and to widen two blocks for a proposed railroad overpass, and another of \$160,000 to Massillon, Ohio, to construct an intercepting sewer to be laid in the bed of the Ohio State canal.

An allotment of \$1,383,442 was made to the Air Corps, War Department, for 19 construction projects at airports in Texas, Illinois, Oklahoma, Kansas and the Canal Zone. Of this total, \$368,742 will be for officers' quarters; \$281,647 for NCO quarters; \$269,922 for field barracks and \$184,369 for hangars.

Construction of new school buildings and additions to existing buildings throughout the county will be undertaken by the Board of Education, Prince George County, Maryland, through use of an allotment of \$408,000. Cedar Rapids was allotted \$683,160 to complete a sewage treatment plant and Cleveland was allowed one grant of \$800,000 to aid in the construction of water supply mains and another of \$135,000 to aid in the construction of the Easterly sewage plant.

The Tennessee Valley Authority will call for bids about Oct. 15 on the construction of a heavy-duty highway from Coal Creek, Tenn., to the site of the Norris Dam. The highway will cost about \$200,000, but will not involve bridges, culverts or other large structures.

Decision to construct the highway was made following surveys and studies which indicated that it would not be necessary to construct a railroad to the site of the dam. The estimated cost of the railroad was \$400,000. It was stated by Arthur E. Mor-

gan, chairman of the Tennessee Valley Authority, that completion of the road by Feb. 1 will permit the moving in of heavy construction machinery by the time the site for the dam has been cleared and the excavation undertaken.

The Bureau of Public Roads has approved about 200 projects in 14 States to cost approximately \$125,000,000. The sums have been distributed as follows: Alabama, \$8,370,133; California, \$15,607,354; Connecticut, \$2,865,740; Florida, \$5,231,834; Georgia, \$10,091,185; Illinois, \$17,570,770; Indiana, \$10,037,843; Kentucky, \$7,517,359; Maryland, \$3,564,527; Mississippi, \$6,978,675; New Jersey, \$6,346,039; Oklahoma, \$9,216,798; Pennsylvania, \$18,891,004; Tennessee, \$8,492,619.

Scrap Codes Hearings to Open on Oct. 10

A CONFERENCE of all national trade associations in the various commodity divisions of the waste materials industry will be held at Washington, on call of the NRA, on Oct. 10. The purpose of the conference is to consider the coordination of the various codes that have been filed for the secondary raw materials industry and to establish representative code authorities for each commodity division. The commodities represented will include scrap iron and steel, non-ferrous scrap metals, scrap rubber, and various scrap textile divisions. Deputy Administrator A. D. Whiteside has been appointed coordinator of all the codes by the six deputies who had previously handled the individual codes. It is expected that the entire industry will be regulated by a common ruling concerning hours and wages, but that each commodity division will have a separate authority to administer its individual regulations.

Malleable Castings Orders Declined

WASHINGTON, Oct. 3.—Orders for malleable castings in August totaled 28,323 tons, compared with 30,195 tons in July, according to reports made to the Bureau of the Census by 122 establishments. Production rose to 31,811 tons from 30,865 tons. In the first eight months of 1933 orders aggregated 168,324 tons against 116,787 tons in the corresponding period of last year, while production increased to 173,365 tons from 121,404 tons.

Revision of Administrative Features of Supply Distributors' Code Proposed

WASHINGTON, Oct. 3.—At the suggestion of Assistant Deputy Administrator George Brady, consideration is being given to the possible revision of administrative features of the code of fair competition filed with the NRA by the Southern Supply and Machinery Distributors' Association and the National Supply and Machinery Distributors' Association.

At the hearing on the code last Wednesday Herbert Edge, president, Topping Brothers, New York, appeared as the representative of the Metropolitan Mill, Marine and Contractors' Supply Institute and outlined problems of his group. He urged the necessity for local administration of the code as distinct from administration by the proposed National Code Authority. Spokesmen for the Chicago, Cincinnati, Pittsburgh and Detroit groups said they were willing to proceed under the proposed National Code Authority but that if the New York Metropolitan area received special treatment, such as suggested by Mr. Edge, they thought their trade areas should receive the same consideration.

As a result, Mr. Brady proposed that Mr. Edge get together with the code committee and representatives of other large trading areas and endeavor to reach an agreement on this point. Mr. Brady emphasized the advisability of a decision so that the Administrator would not find it necessary arbitrarily to determine the point. Mr. Brady had previously asked Mr. Edge whether there would be danger of the Code Authority becoming top-heavy if the country were divided into local districts, each represented on the administrative agency. Mr. Edge conceded this might be true if the number of local districts were large.

Opposes Separate Treatment of Local Districts

H. E. Ruhf, president, National Supply & Machinery Distributors' Association, speaking as a member of the code committee, said that the question raised by Mr. Edge had been discussed in connection with formulation of the code. He said he recognized the peculiar problems in New York but that similar suggestions had come from other centers, some of which had even prepared what they called local codes. Mr. Ruhf pointed out that a great deal could be said on the matter of local code committees or local administration, but explained that it had been found virtually impossible to draw definite lines or districts on account of overlapping territory. The general feeling, he said, was that from a national standpoint there would be

more room for discord if the country were broken up into a series of local districts.

Deputy Brady asked why one section of the country was specifically mentioned if there are to be no districts. George A. Fernley, secretary-treasurer, National Supply and Machinery Distributors' Association, also a member of the code committee, replied that the Southern region comprises 14 States and has its own organization. He stated that Southern members are not eligible to membership in the National association and that members of the latter group are not eligible to join the Southern organization, but that the associations cooperate closely.

Question of Maximum Hours Discussed

The code was presented by Herbert Strong, Strong, Carlisle & Hammond Co., Cleveland, who is chairman of the code committee. The hearing immediately followed the triple convention of the Southern Supply and Machinery Distributors' Association, the National Supply and Machinery Distributors' Association and the American Supply and Machinery Manufacturers' Association.

Mr. Strong told Deputy Brady that the code committee, in dealing with the subject of working hours, had sought only to bring the maximum hour provisions into line with those in the code proposed for the retail trade. This statement was in reply to a question by Labor Advisor Joe Berrell, who wanted to know the reason for changing the labor provisions from a flat 40-hr. maximum week to a flexible maximum, with some classes working 40 hr., others 44 hr., and still others 48 hr.

Mr. Fernley said that members of the two associations have expressed a willingness to accept any maximum hours or minimum wage rates applied to other distributing trades.

Orders for Commercial Steel Castings Lower

WASHINGTON, Oct. 3.—Declining 448 tons, orders for commercial steel castings in August totaled 29,057 tons compared with 29,505 tons in July, according to reports received by the Bureau of the Census from 128 establishments. The August bookings consisted of 21,943 tons of miscellaneous castings and 7,976 tons of railroad specialties. Orders in the first eight months of 1933 aggregated 162,134 tons, a gain of 56,332 tons over

those for the corresponding period of last year.

Production in August at 30,992 tons showed an increase of 1752 tons over the July output. In the first eight months of the current year production was 158,273 tons against 124,574 tons in the corresponding period of last year.

Treasury Wants No Lawyer Negotiators

THE Treasury Department will look with much disfavor on those architects or engineers who retain legal counsel in Washington to aid them in securing professional contracts from the department; in fact, it will be the disposition of the department to eliminate such architects and engineers from consideration altogether. This announcement was recently made by Assistant Secretary of the Treasury Robert, who has requested the American Institute of Architects and American Engineering Council to make the attitude of his office widely known.

Early in the summer the Treasury Department learned that certain Washington lawyers had been soliciting engineers, architects, and others, interested in obtaining Government business, representing that to retain such counsel would enhance the opportunities of the engineers and architects to obtain desirable contracts.

Steel Construction Bookings Are Higher

BOOKINGS of steel construction during August totaled 75,000 tons for 179 reporting companies, as compared with 56,000 tons in July for 192 companies. The American Institute of Steel Construction, Inc., also reports that the tonnage shipped in August was 66,000 tons, which is a 33 per cent advance over the shipments for July. Tonnage on hand for future fabrication aggregated 332,431 tons, as of Aug. 31, for 108 reporting companies. The report ascribes the low volume of operation to the delay of the Federal Government to grant credits for projected public works.

To Take Bids on Light Cruisers

WASHINGTON, Oct. 3.—The Navy Department soon will call for bids for steel for two light cruisers, involving about 14,000 tons, of which about 9250 tons will be plates and 4750 tons shapes. One cruiser each is to be built at the New York and Philadelphia Navy yards. About half of the plates will be galvanized.

Pig Iron Production in Sharp Drop from August Rate

PRODUCTION of coke pig iron in September totaled 1,522,257 gross tons, compared with 1,833,394 tons in August. Output per day in September, at 50,742 tons, showed a drop of 14.2 per cent from the August daily rate of 59,142 tons.

There were 89 furnaces in blast Oct. 1, making iron at the rate of 48,215 tons a day, compared with 98 active stacks on Sept. 1 with a daily operating rate of 56,070 tons. Eleven furnaces were blown out or banked in September, while two, both of them merchant stacks, were lighted. The Steel Corporation showed a loss of four furnaces, while independent steel companies put out seven.

Among the furnaces blown out or banked are the following: One Isabella, of the Carnegie Steel Co.; one Eliza and one Aliquippa, Jones & Laughlin Steel Corp.; one Sparrows Point, Bethlehem Steel Co.; one Haselton, Republic Steel Corp.; one Campbell, Youngstown Sheet & Tube Co.; two Lorain furnaces, National Tube Co.; one South Chicago (old), Illinois Steel Co., and two Weirton furnaces of the National Steel Corp.

Furnaces blown in include: the Brooke furnace of the E. & G. Brooke Iron Co., and the Jisco furnace of the Jackson Iron & Steel Co.

Daily Average Production of Coke Pig Iron

	Gross Tons		
	1933	1932	1931
January	18,348	31,380	55,299
February	19,798	33,251	60,950
March	17,484	31,201	65,556
April	20,787	28,430	67,817
May	28,621	25,276	64,325
June	42,166	20,935	54,621
½ year	24,536	28,412	61,356
July	57,821	18,461	47,201
August	59,142	17,115	41,308
September	50,742	19,753	38,964
October .....	.....	20,800	37,848
November .....	.....	21,042	36,782
December .....	.....	17,615	31,625
Year .....	.....	23,733	50,069

Production of Coke Pig Iron and Ferromanganese

	Gross Tons Pig Iron*		Ferromanganese†	
	1933	1932	1933	1932
January	568,785	972,784	8,810	11,250
February	554,330	964,280	8,591	4,010
March	542,011	967,235	4,783	4,900
April	823,618	852,597	5,857	481
May	887,252	783,554	5,948	5,219
June	1,265,007	628,064	13,074	7,702
½ year	4,441,003	5,168,814	47,063	33,562
July	1,792,452	572,296	18,661	2,299
August	1,833,394	530,576	16,953	3,414
September	1,522,257	592,589	13,339	2,212
October .....	.....	644,808	.....	2,302
November .....	.....	631,280	.....	5,746
December .....	.....	546,080	.....	7,807
Year .....	.....	8,686,443	.....	57,342

*These totals do not include charcoal pig iron. The 1932 production of this iron was 15,055 gross tons.
†Included in pig iron figures.

Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons)		October 1		September 1	
	September (30 Days)	August (31 Days)	Number in Blast	Operating Rate, Tons a Day	Number in Blast	Operating Rate, Tons a Day
New York:						
Buffalo	82,450	87,174	6	2,750	6	2,810
Other New York and Mass..	19,201	18,068	2	640	2	585
Pennsylvania:						
Lehigh Valley	27,053	22,203	2	820	2	715
Schuylkill Valley	13,354	12,757	2	570	1	410
Susquehanna and Lebanon Valleys .....	.....	.....	0	.....	0	.....
Ferromanganese	2,614	2,701	1	85	1	85
Pittsburgh District	336,892	422,360	16	10,890	18	12,520
Ferro. and Spiegel	19,524	10,755	2	605	3	345
Shenango Valley	44,439	50,638	3	1,480	3	1,635
Western Pennsylvania	40,577	52,343	3	1,350	3	1,690
Ferro. and Spiegel	5,444	6,226	1	180	1	200
Maryland	73,883	92,715	3	1,895	4	2,990
Wheeling District	108,803	120,476	4	2,550	6	3,885
Ohio:						
Mahoning Valley	161,037	229,825	8	4,985	10	6,480
Central and Northern	170,855	211,595	9	5,070	11	6,565
Southern	32,600	32,561	3	1,185	2	1,050
Illinois and Indiana	215,866	279,515	11	7,570	12	8,345
Mich., Wis. and Minn.	29,391	30,943	2	980	2	1,000
Colo., Mo. and Utah	17,724	17,758	2	590	2	575
The South:						
Virginia .....	.....	.....	0	.....	0	.....
Kentucky	11,958	12,544	1	400	1	405
Alabama	108,592	120,237	8	3,620	8	3,780
Ferromanganese .....	.....	.....	0	.....	0	.....
Tennessee .....	.....	.....	0	.....	0	.....
Total	1,522,257	1,833,394	89	48,215	98	56,070

Great Lakes Steel Corp. Wins Safety Contest

GREAT LAKES Steel Corp., Detroit, division of National Steel Corp., has been awarded the George W. Kennedy Interplant Safety Trophy by the Detroit Industrial Safety Council for the best safety record of all plants participating in the eleventh interplant contest. It also was awarded a certificate for the best safety record in the metal stamping group in the first six months of 1933. The Ternstedt Mfg. Co., division of General Motors Corp., won a certificate for the best showing in the "metal with foundry" group, Fisher Body Corp. in the machine shop group, and Chrysler Corp. in the automotive group.

The revised standards covering designs for rails and splice bars used by electric railroads, approval of which was recently announced, are now available at 10c. each from the American Standards Association, 29 West Thirty-ninth Street, New York, or from the American Transit Association, 292 Madison Avenue, New York.

Steel Recovery Impeded by Labor Troubles As Code Perplexities Are Clarified

Quarterly Contracting for Bars, Plates and Shapes Satisfactory—Public Works Projects Hastened—Pig Iron Output Off Sharply

LABOR troubles in the plants of both steel makers and consumers are now threatening to impede the progress of the industry. Coming at a time when steel companies were just beginning to function satisfactorily under the commercial provisions of the code, the rapid increase in strikes throughout the metal-working industry is particularly disheartening. A major steel plant in the Wheeling district has been forced to suspend operations entirely and picketing is growing more prevalent at nearby Pittsburgh mills.

The strike of coal miners in Western Pennsylvania has apparently been settled by an agreement between the United Mine Workers and steel companies operating their own mines, which, however, does not include formal recognition of the Union. The flow of steel into the automobile industry is threatened by labor difficulties in the die and tool making industry at Detroit which is now engaged with orders for prospective new models. The quick intervention of the Government in these and other cases indicates the threat to the entire NRA program embodied in such disturbances.

THE placing of fourth quarter contracts for heavy hot-rolled steel products brought considerable tonnage to order books in the past week, and general adherence to the new form of buying agreements, which do not permit cancellations by consumers, defined probable consumer requirements more accurately than heretofore. Expiration of old contracts for sheets and strip steel also brought heavy specifications which will occupy mills for the greater part of October. Tin plate backlogs are adequate for the month, although production has been curtailed by strikes.

The larger steel consuming industries are generally curtailing their requirements and give promise of little sustained improvement in the next two months. Motor car production is declining gradually and output this month is tentatively estimated at 145,000 units, against a probable 185,000 in September. Increased steel takings, however, are unlikely, as automobile companies have been stocking heavily in anticipation of higher prices. This tendency is also noticed among many other consumers of steel, and the extent to which fourth quarter requirements have been discounted will have an important bearing on new buying in the next two months.

THE trend of production in November and December also depends largely upon the efforts of the Federal Government to stimulate business. With more than half of Public Works Administration's fund now allocated, some large projects are beginning to reach the contracting stage. Approximately 52,000 tons of cast iron segments and steel castings has been placed for the Midtown Tunnel at New York, and Cleveland has awarded 12,000 tons of cast iron pipe for waterworks extensions. Bridges over the Niagara River at Grand Island, N. Y., have taken 12,000 tons of structural steel and the Calumet breakwater at Chicago, requiring 8000 tons of sheet steel piling, has been let.

Promise of Government aid to the railroads to finance rail purchases has developed estimated requirements from a number of carriers, amounting to 280,000 tons. Most of this indicated tonnage comes from the Western roads, the larger Eastern systems not having made public their possible needs. Practically all of the prospective purchases are based upon the expectation of a lower rail price. Buying of freight cars and locomotives under similar financial arrangements is still being considered.

DESPITE a sharp decline in the Wheeling district, occasioned by the strike, steel ingot production this week has risen one point to 42 per cent of capacity. With output unchanged at Chicago, Cleveland and Birmingham, operations have been advanced six points to 35 per cent at Pittsburgh and two points to 50 per cent in the Valleys, while the Philadelphia and Buffalo districts have curtailed production one and six points, respectively.

Pig iron output during September dropped to 1,522,257 tons, or 50,742 tons daily, compared with 1,833,394 tons, or 59,142 tons daily in August. The decline of 14.2 per cent followed a 9.4 per cent drop in ingot output during August, while pig iron production was rising 2.2 per cent. Eleven furnaces were blown out or banked during August and two were blown in, a net loss of nine.

Finished steel prices under the code are rapidly becoming clarified, and, with advances of \$3 a ton on bars and \$2 on plates and shapes now effective, THE IRON AGE composite price has been raised to 2.036c. a lb., compared with 1.992c. last week. The pig iron composite, affected by freight rate adjustments, is 10c. a ton lower at \$16.61, while the composite for scrap is down 8c. to \$10.96 a ton.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron	Oct. 3, 1933	Sept. 26, 1933	Sept. 6, 1933	Oct. 4, 1932
<i>Per Gross Ton:</i>				
No. 2 fdy., Philadelphia.....	\$18.26	\$18.34	\$18.34	\$13.84
No. 2, Valley furnace.....	17.50	17.50	17.50	14.50
No. 2 Southern, Cin'ti.....	18.13	18.23	18.23	13.82
No. 2, Birmingham.....	13.50	13.50	13.50	11.00
No. 2 foundry, Chicago*.....	17.50	17.50	17.50	15.50
Basic, del'd eastern Pa.....	17.76	17.84	17.84	13.50
Basic, Valley furnace.....	17.00	17.00	17.00	13.50
Valley Bessemer, del'd P'gh..	19.76	19.89	19.89	16.89
Malleable, Chicago*.....	17.50	17.50	17.50	15.50
Malleable, Valley.....	17.50	17.50	17.50	14.50
L. S. charcoal, Chicago.....	23.54	23.67	23.67	23.17
Ferromanganese, seab'd carlots	\$2.00	\$2.00	\$2.00	68.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton

Finished Steel	Oct. 3, 1933	Sept. 26, 1933	Sept. 6, 1933	Oct. 4, 1932
<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.25	2.25	2.25	2.20
Hot-rolled annealed sheets, No. 24, Chicago dist. mill..	2.35	2.35	2.35	2.30
Sheets, galv., No. 24, P'gh..	2.85	2.85	2.85	2.85
Sheets, galv., No. 24, Chicago dist. mill.....	2.95	2.95	2.95	2.95
Hot-rolled sheets, No. 10, P'gh	1.75	1.75	1.65	1.55
Hot-rolled sheets, No. 10, Chicago dist. mill.....	1.85	1.85	1.75	1.65
Wire nails, Pittsburgh.....	2.10	2.10	2.10	1.95
Wire nails, Chicago dist. mill.	2.15	2.15	2.15	2.00
Plain wire, Pittsburgh.....	2.10	2.10	2.10	2.20
Plain wire, Chicago dist. mill.	2.15	2.15	2.15	2.25
Barbed wire, galv., Pittsburgh	2.60	2.60	2.60	2.60
Barbed wire, galv., Chicago dist. mill.....	2.65	2.65	2.65	2.65
Tin plate, 100 lb. box, P'gh..	\$4.65	\$4.65	\$4.65	\$4.75

Rails, Billets, etc.

<i>Per Gross Ton:</i>				
Rails, heavy, at mill.....	\$40.00	\$40.00	\$40.00	\$43.00
Light rails at mill.....	32.00	32.00	30.00	32.00
Rerolling billets, Pittsburgh.	26.00	26.00	26.00	26.00
Sheet bars, Pittsburgh.....	26.00	26.00	26.00	26.00
Slabs, Pittsburgh.....	26.00	26.00	26.00	26.00
Forging billets, Pittsburgh..	31.00	31.00	31.00	33.00
Wire rods, Pittsburgh.....	35.00	35.00	35.00	37.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb...	1.60	1.60	1.60	1.60

Scrap

<i>Per Gross Ton:</i>				
Heavy melting steel, P'gh...	\$12.75	\$12.75	\$13.25	\$9.75
Heavy melting steel, Phila...	10.50	10.75	12.00	7.25
Heavy melting steel, Ch'go...	9.62½	9.62½	10.00	6.00
Carwheels, Chicago.....	10.00	10.00	10.50	7.00
Carwheels, Philadelphia.....	12.25	12.75	12.75	10.00
No. 1 cast, Pittsburgh.....	11.75	11.75	11.75	10.00
No. 1 cast, Philadelphia.....	11.50	12.50	12.50	9.50
No. 1 cast, Ch'go (net ton)...	10.00	10.00	10.00	6.25
No. 1 RR. wrot., Phila.....	12.00	12.00	12.00	7.50
No. 1 RR. wrot., Ch'go (net)...	8.50	8.50	9.00	5.00

Finished Steel

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.75	1.60	1.60	1.60
Bars, Chicago	1.80	1.65	1.65	1.70
Bars, Cleveland.....	1.80	1.65	1.65	1.65
Bars, New York.....	2.08	1.95	1.95	1.95
Tank plates, Pittsburgh.....	1.70	1.60	1.60	1.60
Tank plates, Chicago.....	1.75	1.65	1.65	1.70
Tank plates, New York.....	1.98	1.898	1.898	1.898
Structural shapes, P'gh.....	1.70	1.60	1.60	1.60
Structural shapes, Chicago...	1.75	1.65	1.65	1.70
Structural shapes, New York.	1.95½	1.86775	1.86775	1.86775
Cold-finished bars, Pittsburgh.	1.95	1.95	1.70	1.70
Hot-rolled strips, Pittsburgh.	1.75	1.75	1.65	1.45
Cold-rolled strips, Pittsburgh.	2.40	2.40	2.25	1.90

Coke, Connellsville

<i>Per Net Ton at Oven:</i>				
Furnace coke, prompt.....	\$2.50	\$2.50	\$2.50	\$2.00
Foundry coke, prompt.....	3.25	3.25	3.25	2.75

Metals

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Electrolytic copper, refinery..	8.75	8.75	8.75	6.00
Lake copper, New York.....	9.00	9.00	9.00	6.25
Tin (Straits), New York....	48.62½	47.20	45.50	24.50
Zinc, East St. Louis.....	4.75	4.75	4.70	3.10
Zinc, New York.....	5.12	5.12	5.07	3.47
Lead, St. Louis.....	4.35	4.35	4.35	3.10
Lead, New York.....	4.50	4.50	4.50	3.25
Antimony (Asiatic), N. Y...	7.00	7.00	6.87½	5.62½

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
Oct. 3, 1933	2.036c. a Lb.	\$16.61 a Gross Ton	\$10.96 a Gross Ton
One week ago	1.992c.	16.71	11.04
One month ago	1.979c.	16.71	11.75
One year ago	1.977c.	13.64	7.67
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.
	HIGH 2.036c., Oct. 3; 1.867c., Apr. 18	HIGH \$16.71, Aug. 29; \$13.56; Jan. 3	HIGH \$12.25, Aug. 8; \$6.75, Jan. 3
1933	1.977c., Oct. 4; 1.926c., Feb. 2	14.81, Jan. 5; 13.56, Dec. 6	8.50, Jan. 12; 6.42, July 5
1932	2.037c., Jan. 13; 1.945c., Dec. 29	15.90, Jan. 6; 14.79, Dec. 15	11.33, Jan. 6; 8.50, Dec. 29
1931	2.037c., Jan. 14; 2.018c., Dec. 9	18.21, Jan. 7; 15.90, Dec. 16	15.00, Feb. 18; 11.25, Dec. 9
1930	2.317c., April 2; 2.273c., Oct. 29	18.71, May 14; 18.21, Dec. 17	17.58, Jan. 29; 14.08, Dec. 3
1929	2.286c., Dec. 11; 2.217c., July 17	18.59, Nov. 27; 17.04, July 24	16.50, Dec. 31; 13.08, July 2
1928	2.402c., Jan. 4; 2.212c., Nov. 1	19.71, Jan. 4; 17.54, Nov. 1	15.25; Jan. 11; 13.08, Nov. 22

Labor Troubles Overshadow Pittsburgh Steel Situation



Bar, Plate and Shape Commitments Heavier—Production Curtailed by Strikes in Wheeling District, But Is Higher in Valleys and Pittsburgh

PITTSBURGH, Oct. 3.—Fourth quarter commitments on heavy hot-rolled steel products entered just prior to the close of September were in exceptionally good volume. Contracting for soft steel bars predominated. Some stock buying of structural shapes and plates also helped to swell mill order books. The volume of business booked in anticipation of price advances on Oct. 1, however, is considered insufficient to extend present mill operating schedules beyond the close of October.

A last minute spurt in strip steel specifications against third quarter contracts provided strip mills with backlogs for the next few weeks. Sheet orders, however, have not improved and sheet mills will be in need of tonnage by the middle of the month if current operations are to be sustained. Although the cold-finished bar price has been extended for fourth quarter, a moderate amount of buying is being prompted by an expected advance of \$3 a ton which may be filed some time this week.

Since the price advances on Oct. 1 business has fallen off sharply and prospects for the final quarter are very indefinite. Strikes at a Wheeling district mill and picketing at a leading Pittsburgh steel plant have bunkered the local steel industry's approach to normalcy. Continued widespread strikes in the western Pennsylvania fuel regions also cloud the immediate outlook, with particular uncertainty as to future steel producing costs.

Operations in the Wheeling district average sharply lower this week as a result of strikes and are scheduled at about 57 per cent of capacity, compared with 72 per cent a week ago. Production in the Pittsburgh district this week has risen six points to 35 per cent. Output in the valleys and nearby northern Ohio mills has also been stepped up to 55 per cent of capacity.

Pig Iron

Consumer interest continues to be extremely light. Scattered car-lot trading characterizes the current market. Movement of basic iron has been retarded noticeably by reduced operations at non-integrated steel plants. Deliveries to the foundry trade are also sluggish. Current base prices

are unchanged for delivery through fourth quarter.

Semi-Finished Steel

Movement of billets, slabs and sheet bars has been adversely affected by strikes in the Wheeling district. Demand from non-integrated mills in the Pittsburgh district has shown no improvement, although calls for sheet bars are fairly lively. Current prices are quotable for delivery through the year.

Bolts, Nuts and Rivets

Very little demand for these products has appeared in the past few weeks. Current prices are effective only for delivery through October. Quotations for the remainder of the quarter will likely be announced within the next two weeks.

Bars, Plates and Shapes

Considerable fourth quarter tonnage was committed during the past week at the old price of 1.60c., Pittsburgh. The new prices are now in effect, but bookings have fallen off sharply since the advances on Sept. 30. Soft steel bars are now based at 1.75c., Pittsburgh, and tank plates and structural shapes at 1.70c., Pittsburgh. Billet steel reinforcing bars in stock lengths as quoted by distributors are unchanged at 1.80c., Pittsburgh, for fourth quarter. Some outstanding quotations of 1.60c., on structural shapes are being protected for an indefinite period, provided lettings of projects are made on or before Oct. 5.

Demand for heavy hot-rolled products shows definite improvement. Projected structural steel work is increasing, and several important projects that have been dormant are again up for bidding. Most important among these revived jobs is the New York post office, which will require about 12,000 tons of structural shapes. Small lot projects have also increased. Specific structural steel awards in the past week were rather light. Tentative placement of contracts for the Grand Island, N. Y., bridge may soon bring a substantial order for structural shapes to a local mill. Demand for concrete steel bars is slightly improved. A dam at Galipolis, Ohio, will need 450 tons, and the Panama Canal Zone is inquiring

for 330 tons for general requirements. The plate market has been enlivened by barge inquiries involving approximately 10,000 tons, most of which is for private work. Tank projects are notably lagging, and railroad repair work has not yet opened up much demand for plates.

Rails and Track Accessories

The Government sponsored rail purchases continue to hold the chief interest. This program is expected to reach a definite point this week, but thus far open inquiries for any substantial tonnages have not been broadcast by the carriers. With about 1,000,000 tons of rails estimated to be needed a substantial tonnage of track accessories will be required to supplement rail purchases. As in the case of rails, however, no definite inquiries for accessories have appeared. Opening of bids for fourth quarter steel requirements of several carriers revealed only moderate tonnages of various steel products.

Wire Products

Practically no change in the character of demand is noticeable. Consumers are still hesitant about entering forward commitments, and new business is consequently restricted to minor quantities. Some new contracts for wire nails at \$2.10, base, per keg, Pittsburgh, have been entered for fourth quarter. Manufacturers' wire, which is quoted at 2.10c., Pittsburgh, is particularly quiet. Wire mill operations are slowly losing ground, and this week's schedules average between 55 and 60 per cent of capacity.

Sheets

Very little tonnage has been booked for fourth quarter, and third quarter carry-overs will scarcely run sheet mills at the present rate beyond the middle of October. The automotive industry still accounts for the bulk of current takings, but specifications for next year's model are being generally withheld because of uncertainty growing out of labor difficulties among tool and die workers. Miscellaneous sheet demand is poor, with black and galvanized sheets particularly quiet. Production on the Argentine export order for galvanized will be completed by a local mill within a week or two. Strikes at the Weirton, W. Va., plant have affected average sheet mill operations, which are now scheduled at barely 45 per cent of capacity.

Tubular Goods

Mechanical tubing and boiler tubes are fairly active, but general demand for tubular products is still apathetic. The market continues to lack the support of important line projects. Oil country goods are still depressed by Federal drilling restrictions in the East Texas and Conroe fields. Standard pipe is quiet, reflecting the well bought position of most jobbers who

covered freely prior to the price advance on July 1.

Cold-Finished Steel Bars

Producers have opened books for fourth quarter tonnage at 1.95c., Pittsburgh. Higher prices, however, will probably be filed some time this week, and are expected to reflect the \$3 a ton advance effective last week on hot-rolled bars. In the meantime, the expected advance is prompting a fair amount of buying, chiefly from miscellaneous sources. Manufacturers of business machines and washing machines are displaying keen interest, while automobile and parts makers continue to order cautiously. Jobbers are generally out of the market, having stocked heavily at lower prices in effect prior to Aug. 1.

Tin Plate

With operations at one mill halted by strikes, tin plate production in this district has failed for the first time in many weeks to hold at capacity. Operations in the current week average not more than 85 per cent. A number of mills, following a program of spreading work among a greater number of employees, are now operating at 15 turns instead of 16 turns previously in effect. Specifications against low-priced contracts are still heavy, although not so large as a month ago. Very little spot business is reported at the new price of \$4.65 per base box.

Ferroalloys

Ferromanganese, 80 per cent, has been reaffirmed for fourth quarter at \$82 a gross ton in carloads, and at \$89 in less carload lots, f.o.b. Atlantic seaboard.

Strip Steel

Specifications against old low-priced contracts were fairly heavy prior to the closing date on Sept. 30. Automobile makers specified very freely in anticipation of advanced quotations, and miscellaneous consumers were also in good evidence. Radio manufacturers have not yet measured up to their expected seasonal requirements, nor have toy makers been particularly heavy buyers of strip this season. All new business is now entered at 1.75c. for hot-rolled, and 2.40c. for cold-rolled, Pittsburgh base. Shipments against all old contracts must be completed by Oct. 15. Most mills have enough tonnage on their books to maintain present operations for several weeks. Strikes have naturally affected the general average, which is now rated at 45 to 50 per cent of capacity.

Coke and Coal

With Western Pennsylvania fuel operations paralyzed by strikes, this market is at a standstill. Most of the larger consumers are believed to be covered for their early requirements, and no effort to obtain additional tonnage in outside districts is openly reported. In the absence of transactions,

prices cannot be gaged accurately, but are nominally unchanged.

Scrap

Deliveries to a large consumer in the Wheeling district have been halted by strikes. Suspensions are still in effect at several other important plants. In no case is scrap being accepted freely. Mills continue to draw upon stocks, and, with shipments generally inadequate to replenish consumers' supplies, some buying is looked for by the close of October. At present, however, consumers are apparently wholly unconcerned about their forward needs. In the absence of important transactions, no price changes have been recorded in the past week. No. 1 heavy melting steel is nominally unchanged at \$12.50 to \$13. Some indication of the market may be discernible this week when bids will be opened by the Pennsylvania Railroad on about 24,000 tons of scrap, including 5150 tons of No. 1 heavy melting steel. The Baltimore & Ohio will open bids Oct. 9 on 6750 tons, most of which is No. 1 steel and rails. The Baltimore & Ohio scrap will probably not come into the immediate Pittsburgh district.

Ensley Rail Mill Starts Up for Short Run

BIRMINGHAM, Oct. 3.—The fourth quarter opens with but little activity in either pig iron or steel. It is expected that contract tonnage in pig iron will be more carefully placed, in view of decreased current requirements, stricter code regulations and the present lag in industrial activity. The last two weeks have seen a small volume of forward buying, but it is far below that of the summer. September shipments did not maintain the August rate. Furnace operations are unchanged, with eight stacks active.

Steel

Fourth quarter contracting is in progress at the new prices effective Sept. 30, but the tonnage involved is still of ordinary proportions. Road work in the South is now gaining momentum and there will be lettings by one or more states nearly every week for the next two months. These will provide some relief for the structural steel and bar fabricators. The Ensley rail mill of the Tennessee Coal, Iron & Railroad Co. opened Monday to roll about 5000 tons. It is not likely that the mill will work beyond this week. Hot metal is being brought from the Fairfield works, and there will be no resumption of the Ensley blast furnaces and open-hearths. The Central of Georgia has advised Washington that it is willing to purchase 3000 tons of steel rails from Birmingham, if approval is given by the Federal court. Eleven open-hearths were operated last week, the same as throughout the month.

Drop in Steel Output in Buffalo District

BUFFALO, Oct. 3.—The Lackawanna plant of the Bethlehem Steel Corp. raised its output to 50 per cent of capacity over the weekend, when three more open-hearth furnaces were lighted. This rate, however, was not maintained past the early part of this week, when four furnaces were retired from operation. The Republic Steel Corp. is operating five furnaces, and Wickwire-Spencer two. The Seneca sheet division of Bethlehem is operating at 80 per cent.

Pig iron inquiries are few. Producers say that users are now ordering without the formality of an inquiry, but current orders are for very small amounts, no sizable lots having been placed during the week.

Scrap

Further sales have established the present market for No. 1 and No. 2 heavy melting steel at \$10 and \$9, respectively. From 2000 to 2500 tons has been sold by dealers since last week at these prices. While prices at present are softer, there are indications that they will recover strength if railroad buying begins shortly. Reports are current that a large user wishes to buy a sizable tonnage of No. 1 heavy melting steel for \$10.50, but dealers will not commit themselves at that price. Scattered sales of No. 1 heavy cast have been made at \$11.50.

255,000 Tons of Rails Already in Prospect

WITH the promise of loans at a low interest rate from the Public Works Administration to finance rail purchases, a number of the carriers have indicated their probable requirements for laying during the remainder of 1933 and 1934. Definite commitments amount to well under 200,000 tons, but possible purchases, pending the approval of directors, receivers in some instances, and of the Public Works Administration, which have been announced thus far, amount to 255,000 tons. These are as follows:

Central of Georgia	3,000
Chicago, Burlington & Quincy	25,000
Chicago, Milwaukee, St. Paul & Pacific	25,000
Chicago & North Western	60,000
Chicago, Rock Island & Pacific	5,000
Delaware, Lackawanna & Western	12,000
Illinois Central	20,000
New York, New Haven & Hartford	20,000
Norfolk & Western	10,000
St. Louis-San Francisco	25,000
Southern Pacific	25,000
Union Pacific	25,000
Total	255,000

Western Roads to Place 280,000 Tons of Rails



Chicago Ingot Rate Holds at 46 Per Cent of Capacity — Fabricating Outlook Improves as Government-Aid Work Matures

CHICAGO, Oct. 3.—Ingot output is holding the gain made a week ago and still stands at 46 per cent of capacity. The outlook for further improvement is somewhat mixed. Western railroads have tentatively committed themselves to purchase over 250,000 tons of rails and fastenings. To the list already known is now to be added the Rock Island, which has in mind ordering 30,000 tons of rails. Entering the railroad equipment field are the Armour Car lines, which have inquiries out for 500 beef refrigerator cars.

Nash Motors is introducing new models, but as a whole automobile manufacturers will delay similar moves for 30 to 45 days, and some of them will wait until the close approach of the national shows. In the meantime, many parts manufacturers are specifying heavily against old commitments made before prices advanced.

Strikes in the Detroit area are holding up much work in Chicago, as well as machine tool business that recently was placed at Rockford by automobile manufacturers. The labor situation in Chicago remains quiet insofar as the metal-working industry is concerned, but other industries are not faring so well.

Fully 25,000 tons of steel for Government-Aid work is expected to be let in the next few weeks. Although this will help local fabricators, it will not materially lift output above the current rate of 15 to 20 per cent of capacity.

Taken as a whole, the dominant market stimulus is that resulting from consumers' desire to take in all possible tonnage contracted for before current price levels were reached.

Pig Iron

Releases of Northern foundry iron are steady, and new sales are being made on the basis of actual needs. The future course of prices is somewhat in doubt in view of the fact that coal prices are advancing. It is logical to expect pig iron producers to keep abreast of upward movements in prices of raw materials. The differential of 38c. a ton between delivered prices of Northern and Southern irons is being maintained.

Cast Iron Pipe

Sellers, realizing for some time that the bulk of sales would come from

Government aid projects, have now come to realize that those jobs move very slowly. In some cases 30 days have lapsed since municipalities were assured money would be available and to date the money has not been placed at the disposal of the local authorities. It is estimated by some that these delays will hold the cast iron pipe market stagnant for at least another 30 days. Elimination of the surcharge on freight rates will lower the cost of pipe delivered at Chicago by 40c. a ton.

Reinforcing Bars

Awards, with the exception of a few of 10 tons and less, are confined to road work in Wisconsin. The Illinois road program still drags, and Washington has started to look into the matter to determine why money made available months ago is not now being used. The unfortunate part of the situation is that cold weather is so close at hand that most road and some bridge work will have to be deferred until next spring.

Rails and Track Supplies

Executives of a number of Western railroads have made announcements as to the probable tonnages of rails that will be purchased. Some of them are outspoken in their insistence on lower prices. Fully 200,000 tons of rail business is now definitely in sight in the West, and options may swell this figure. The list of prospective purchasers includes the Santa Fe, the Union Pacific, the Milwaukee Road, the Burlington and the Illinois Central. Accessories necessary for these rails would total close to 60,000 tons. Releases against old rail contracts are heavier and rolling schedules are well maintained.

Plates

Prices now stand at 1.75c. a lb., Chicago. Miscellaneous demand for plates for tank construction has mounted sharply to 5000 tons, little of which will go to oil producers. Low bidders have been announced on the three Mississippi River dams, which will require about 10,000 tons of steel, and the Inland Steel Co. has taken 8000 tons of steel sheet piling for breakwaters that will be constructed at the southern end of Lake Michigan. Brewery demand for tanks is lighter, but distillery needs are mounting. A

second project now being under way in central Illinois.

Cold-Rolled Strips

Mills are operating at capacity, which under present conditions happens to be below the normal tonnage rating for the reason that specifications are not well balanced, running strongly to the narrower widths. Most current shipments are against commitments made at 2.25c. a lb., Cleveland, and lower.

Wire Products

Sellers are anxiously awaiting more definite signs of a fall upturn. New buying is dragging and specifications are spotty. Output is being maintained at 50 to 52 per cent of capacity. The jobbers' code became operative Oct. 2, but it is not meeting with general acceptance and many of the larger jobbers have not yet signed. Difficulties have also been encountered in connection with the preparation of a retailers' code.

Structural Shapes

Awards, at 2100 tons, again are light, but inquiries, at 10,000 tons, are encouraging. The State of Illinois is figuring on two bridges that will take 3000 tons, and a Navy Yard machine shop on the Pacific Coast calls for 4000 tons. The first unit for a distillery at Pekin, Ill., has been placed, and other awards for this development are expected in the near future. Structural shapes are now quoted at 1.75c. a lb., Chicago.

Sheets

Specifications and shipments against old contracts remain at a high level and from all indications will remain so throughout most of the month. New business is dragging and is not likely to pick up until automobile manufacturers start production of new models, which in some cases will be in about 30 days.

Bars

Mild steel bars are now being quoted at 1.80c. a lb., Chicago, and rail steel bars are priced at 1.70c. No word is to be had here as to final action to be taken by iron bar sellers in meeting these advances. Farm implement manufacturers are still hopeful that definite manufacturing schedules can be started this fall.

Scrap

Dealers are expecting higher prices and are now quite willing to add to their accumulations. Supplies of all grades are more plentiful and brokers find \$9.25 to \$9.50 a ton, delivered, all they must bid for tonnages of heavy melting steel needed to fill old orders. The Burlington, which sold 2000 tons of heavy melting steel, obtained about \$9.85 a ton, but the Santa Fe, which offered 10,000 tons, withdrew its list, evidently for the reason that it considered bids too low. The Frisco lines will wreck 3000 cars.

Contracting for Bars, Plates and Shapes Heavy in N.Y. Area



New Prices Now Generally Effective—Tin Plate Specifications Holding Up—51,800 Tons of Segments for Tunnel Placed

NEW YORK, Oct. 3.—Local sales offices report a comparatively large volume of bookings of fourth quarter contracts for bars, plates and shapes under the new contracting arrangements. Large buyers generally took advantage of the contract calling for a percentage of their requirements but specifying only a nominal minimum. Many smaller users were covered under the 20 to 100-ton contract of which they must take at least 20 tons and of which part of the remainder can be cancelled if not specified by December. Contracts were generally taken at 1.60c., Pittsburgh, for bars; 1.70c., Coatesville or Sparrows Point, for plates, and 1.70c., Bethlehem, for structural shapes. The new prices \$2 a ton higher on plates and shapes and \$3 a ton higher on bars are now in general effect.

Specifications for the lighter finished steel products were fairly heavy last week and the month compared more favorably with August than had been anticipated. Tin plate demand is holding up well and export business is still an important factor. Sheets are rather quiet.

Building projects to be financed by the Government are still largely lacking in the district, although the Bethlehem Steel Co. has been awarded 51,800 tons of cast iron segments and steel castings for the Midtown New York tunnel. Approximately 2000 tons of bolts will be bought in the near future prior to the letting of the general contract for the job. Bids have again been taken on a post office addition in New York, requiring 12,500 tons of structural steel. A considerable tonnage of sheet steel piling will be required for harbor improvement work in the Eastern district. Private structural steel activity is still light.

Steel companies are still hopeful regarding railroad purchases but Eastern carriers have been slow to indicate the rail tonnages they will require under the Government's plan to finance purchases at a low rate of interest. The possibility of inaugurating freight car and locomotive purchases under the same plan is still rather indefinite.

Prices on the principal finished steel products are now generally es-

tablished for the fourth quarter and consumers are showing a disposition to cooperate with steel makers in adhering to the code regulations. Quantity extras on sheet steel in less than carload lots have again been revised and now stand at 15c. per 100 lb. for 7500 lb. or over, and 25c. per 100 lb. for less than 7500 lb.

Pig Iron

Shipments continue moderately heavy as many melters make heavier releases than required by current activity. Most low-priced contracts are practically completed, and heavier purchasing, against spot needs, is reported. Orders booked during the past seven-day period aggregated 2800 tons, as compared with 2400 tons last week and 1900 tons a fortnight ago. General inquiry is somewhat heavier, and two New England foundries are inquiring for 1000 tons and 500 tons respectively. Current quotations are firm, but higher conversion costs, together with the confused labor situation in the Connellsville region, is leading local sellers to expect advanced quotations when first quarter prices are announced on Dec. 1. Bethlehem Steel Co. will melt approximately 4000 tons a month to fulfill the recently awarded contract for tunnel segments.

Scrap

Failure of mills to permit shipments, together with the negligible volume of fresh purchasing, has left the local market virtually without domestic support. Prices are steady, however, as a result of well maintained export activities of the major brokers. Japanese, Italian and Polish melters have received large tonnages of heavy melting grades, and a number of additional export bookings have been made. Since export contracts necessitate buying for the next two months, no drastic market slump is expected. Nevertheless, a number of yards are displaying some uneasiness, and brokers are experiencing no difficulty in securing steel at current price levels. The usual purchases of No. 1 heavy melting, for a Bridgeport melter, continue to be made at \$8 a ton, barge. Other grades are nominal and unchanged. Bethlehem Steel Co. will require over 25,000 tons of blast furnace scrap during the next eight

months to complete the recently awarded tunnel segments.

Reinforcing Steel

Moderate road mesh tonnages for New York and New Jersey are being placed by contractors, but bar bookings are in negligible volume. Distributors' stocks of steel, which have been available at heavily shaded levels, are about depleted, and restocked cut length billet bars are firm at 1.95c. a lb., Pittsburgh base. Kalman Steel Corp. will supply 750 tons of mesh for highway contractors in Fulton and Westchester counties, N. Y., and Concrete Steel Co. has been awarded 130 tons of bars for a grade separation in Nassau County, N. Y. Truscon Steel Co. has taken 275 tons of road mesh for work in New Jersey and Rhode Island. Pending work involves substantial tonnages for highway construction. An award of 240 tons of bars for the Manhattan midtown postoffice will be announced within the next two weeks.

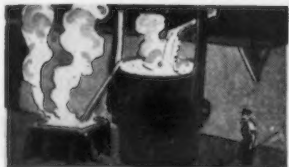
Pig Iron Price Situation Clarified at St. Louis

ST. LOUIS, Oct. 3.—The delivered price of Southern pig iron in the St. Louis industrial district again is 38c. a ton less than the delivered quotations on Granite City iron. The differential, after being abolished for a few days, was reestablished last week. However, the practice of adding the actual switching charge to the base price to fix the delivered price has been abolished, and instead the delivered price will be the base price at Granite City, plus 50c. average switching charge to switching points in the St. Louis industrial district. Shipments of pig iron by the local maker in September were considerably heavier than for the preceding month, one reason for the gain being a desire to complete shipments against third quarter contracts.

In finished steel, fourth quarter contracting has been limited mainly to structural plates, shapes and bars. Buying was not heavy, because the mills limited the tonnages to nominal amounts, so that the bulk of the purchases during the coming quarter would be at new, higher prices. In general, orders were limited to from five to ten per cent of quarterly requirements of customers. The State of Oklahoma, which let contracts last week for approximately 1350 tons of structural steel for highway bridges, will open bids on Oct. 3 for four bridges requiring 800 tons.

No. 2 heavy melting steel was sold at 25c. a ton less this week than in the preceding sale. Other items are nominally unchanged. Mills are awaiting orders for finished products before buying additional scrap. Most of the material listed for sale by two railroads last week was withdrawn because of low bids.

Bulge in Contracting in Eastern Pennsylvania



Buyers Place Considerable Tonnage in Plates, Shapes and Bars Before Effective Date of Price Advances—Output Slightly Lower

PHILADELPHIA, Oct. 3.—Makers of plates, shapes and bars were kept busy the latter part of last week closing contracts at the third quarter levels. Consumers, anxious for coverage before the increases in prices effective Oct. 2, bought in comparatively good-sized lots, considering the present condition of their own markets. As a result mills have built up fair-sized backlogs on these heavy products, but in the absence of another early buying movement, not now in prospect, will be forced to lighten their schedules. They are hoping for releases either late in October or early next month for requirements in connection with the public works program. So far tonnages from this source have been almost nil in this district.

Railroad buying also is light, and steel makers are watching anxiously the outcome of the Government negotiations for large-scale carrier purchases, apparently to be started by rail contracts. However, there is considerable doubt that the railroads are prepared to enter the market for much tonnage for cars and locomotives unless they are convinced of advantages the Government may give to stimulate capital goods investment.

Steel code interpretations are gradually being cleared up but still are causing a great deal of confusion and some dissatisfaction. Automotive buyers especially continue to insist on preferential treatment.

The scrap market has eased off further with heavy melting steel dropping to a flat price of \$10.50.

Open-hearth operations have declined one point to 34 per cent of capacity.

Plates, Shapes and Bars

Makers were kept busy last week closing tonnages at third quarter prices. There was a fair rush for coverage and, while no large single bookings were entered, in the aggregate they reached a good-sized volume as the final quarter was entered. However, unless new bookings come in soon a sag will develop. Mills are hoping for releases in good-sized quantities either late in October or early in November from public works projects. Results from the program so far have been disappointing.

Railroad buying also is light. The Pennsylvania on Sept. 28 opened bids on miscellaneous lines up to 10,000 tons and on the day following took bids on 500 tons of sheets. The bids were opened under the Clayton act. It is not known what part of the tonnages will actually be awarded. The inquiries were sent to mills as fourth quarter requirements.

Only one bid, made by the Moore Shipbuilding Co., San Francisco, was submitted for construction of the lighthouse tender Hollyhock, while the Boston Navy Yard was the only bidder for the lighthouse tender Tamarack. The former will require 335 tons and the latter 125 tons of plates. It is said that labor clauses caused shipbuilders generally from submitting bids. New bids may be asked. Both vessels are for Great Lakes service.

Pig Iron

New buying is confined to small lots, chiefly of foundry grades. Requirements are holding up comparatively well. Approximately 25,000 tons of iron will be required for cast iron tunnel segments awarded last week by the Port of New York Authority to the Bethlehem Steel Co. Makers of ferromanganese have announced continuance of the \$82, seaboard, price for the fourth quarter. Removal of the surcharge on pig iron is expected to give a slight impetus to shipments.

Sheets

With automotive buyers well stocked, tonnage from this important source going to the mills has shown a substantial drop. Purchases made at third quarter levels, however, were large and producers still have good-sized backlogs and continue to operate at a high rate. There was a fair coverage last week on contracts to protect the former price of 1.65c., Pittsburgh, on No. 10 hot-rolled sheets, now quoted at 1.75c. Stove-makers are buying fair-sized quantities of enameled sheets, and there also has been a moderate pickup in demand from radio manufacturers.

Warehouse Business

Jobbers report that business is holding at about the same level that has

been maintained the past two weeks. Prices are unchanged.

Imports

The following iron and steel imports were received here last week: 5436 tons of pig iron from the Netherlands and 1282 tons of the same product from British India, 1000 tons of chrome ore from Cuba and 200 tons of iron ore from Germany.

Scrap

Reflecting further softness, the market for scrap has eased off 50c. to \$1 per ton. Sales of No. 1 heavy melting steel have been made at \$10.50 and of No. 2 heavy melting steel at \$9 the past week. Other grades have shown sympathetic declines. Mills are buying cautiously and generally only for immediate requirements.

Pig Iron Shipments Rise at Cincinnati

CINCINNATI, Oct. 3.—Pig iron shipments rose sharply last week, when consumers ordered out material on old contracts to escape cancellation on Oct. 1. For the first time in the past two years, the movement of pig iron is abreast of the contract rate. Few, if any, contracts will be erased from furnace books, and only a small number will be carried over into the fourth quarter, the bulk having been completed this month. New business, the past week, totaled about 400 tons. A railroad purchased 160 tons of Southern iron for current use, but other orders were for single car lots. A slight improvement in machine tool business has been reflected in moderate improvement in the melt of tool foundries, but this gain has not been sufficient to raise the general average of foundry operations. The pending revision of freight tariffs, following the removal of the emergency surcharge, is an element of uncertainty in the market situation.

Coke

Rumors of price advances on Oct. 1, still unconfirmed, have stimulated coke shipments. With most consumers under contract, however, new business has not been great.

Steel

Bookings of sheet mills have declined further, since most consumers are now carrying fairly substantial inventories. New business is equivalent to 50 per cent of mill capacity. Operations are set at about 60 per cent, and backlogs are expected to be wiped out by the end of the week.

Scrap

Further weakness in scrap has loosened the supply of material, dealers fearing they will be forced to take lower prices for present yard supplies.

Output Maintained at 45 Per Cent at Cleveland



But Mill Backlogs Are Shrinking Despite General Covering on Heavy Rolled Products—Cleveland Awards 12,000 Tons of Cast Pipe

CLEVELAND, Oct. 3.—A large number of fourth quarter contracts for bars, plates and shapes have been placed, nearly all consumers having covered for that delivery before Oct. 1, when the new prices became effective. However, a very conservative policy was followed in making contracts, which are now iron-clad, most of them having been for smaller lots that would have been the case if unspecified tonnage were subject to cancellation at the end of the quarter. Consequently the aggregate tonnage covered by these contracts is not large.

Few contracts for sheets and strip steel have been taken, buyers not having the incentive of a price advance to get under cover at the start of the quarter.

Specifications against third quarter contracts for bars, plates and shapes came out in good volume up to Oct. 1, the deadline date, as contract buyers had the advantage of old extras. Steel fabricators have covered for structural shapes at the old prices for limited tonnages for their small miscellaneous requirements, but will have to pay the new prices for steel for any sizeable jobs. Railroads have covered for their requirements in bars, plates and shapes for the quarter. Consumers of sheets and strip steel have accumulated large stocks placed at the old prices, and these will be increased by shipments not yet made by the mills. Consequently new demand for these products is expected to be light for the greater part of October.

Ingot output in the Cleveland-Lorain territory is unchanged for the fourth successive week at 45 per cent of capacity. However, mills are rapidly reducing their backlogs and it is doubtful if present operations can be long maintained. While some of the sheet and strip mills in this district have enough tonnage to keep them busy three weeks, some Ohio sheet mills curtailed operations this week.

The expected price advance on cold-finished steel for the coming quarter has not been made and producers have opened their books for the quarter at 2c., Cleveland. Scrap is weaker with reductions of 25c. to 50c. a ton.

Pig Iron

Sales and inquiry have improved somewhat, one producer having sold

3000 tons, mostly in fourth quarter contracts. Consumers are cautious in making commitments because of the provisions of the code. Shipments during September showed a moderate gain over the previous month. With motor car production slowing in preparation for the bringing out of new models, demand from automobile foundries has slackened.

Bolts, Nuts and Rivets

Business from the railroads has increased, but orders from the automotive industry have declined. Makers are getting many small orders, but there is no call for large lots. September business fell off about 15 per cent as compared with August. Rivet makers report an improvement in railroad orders.

Iron Ore

Water shipments from the Lake Superior district during September increased to 5,504,175 tons as compared with 5,100,702 tons in August. Shipments for the season until Oct. 1 were 16,301,573 tons, a gain of 581 per cent over the same period last year, during which shipments were 2,391,155 tons. No change is being made in recent estimates that the movement for the season will be about 20,000,000 tons.

Sheets

Most consumers have accumulated good stocks in orders placed against third quarter contracts at the old prices, and new business is very light, being confined to small lots. Some mills have about finished shipments against third quarter contracts, but others will not complete the filling of these orders for about three weeks. Few contracts for the current quarter have been made.

Cast Iron Pipe

Cleveland has awarded 5400 tons of cast iron pipe for water works extensions to J. B. Clow & Sons, and 6600 tons to United States Pipe & Foundry Co.

Bars, Plates and Shapes

Public work has caused somewhat more activity in structural steel. An award of 600 tons of shapes and 250 tons of reinforcing bars has been made for the Cleveland incinerator plant. A

highway bridge at Leavittsburg will take 735 tons of structural shapes, and several small bridges, 200 tons of reinforcing bars, bids for which will be taken Oct. 6. An award of 8000 tons of sheet steel piling for the Calumet breakwater has been made by United States Engineers, who are also working on plans for other breakwater projects.

Strip Steel

Several of the mills still have a good backlog in orders for both hot and cold-rolled strip taken against old contracts and will not complete making shipments against these orders for about three weeks. A small amount of business in fill-in tonnage is coming from the automotive industry and other consumers. A tendency is reported among some of the automobile manufacturers to substitute painted lamp shells for the present chromium-plated shells. This will result in the use of steel instead of brass for the shells.

Scrap

A local consumer during the week purchased a small tonnage of borings and turnings at \$8 and \$8.25. New demand from other sources is slack. As the expected improvement in the demand which supported prices for several weeks has failed to materialize, a weak tone has developed in the market, which price declines of 25c. to 50c. a ton on both steel-making and blast furnace grades.

Pig Iron Melt in New England Increasing

BOSTON, Oct. 3.—Current pig iron sales are rather limited, and there is but one open inquiry, 500 to 1000 tons of No. 2x for a northern New England melter. Foundries are freely taking iron on old contracts, however, and furnace backlogs, so far as this section of the country is concerned, are shrinking noticeably. Further improvement in the New England melt is noted. Worcester, Mass., is making a much better showing than a month or so ago. The American Steel & Wire Co. is operating all of its six furnaces; Crompton & Knowles Loom Works is running full; the largest jobbing foundry is working five days a week, as against one heretofore, while all other plants in that city are doing better.

Scrap is inactive, with prices purely nominal. Pennsylvania mills are continuing to hold up shipments on old contracts, and New England consumers have virtually withdrawn from the market. There are no indications when buying will resume. Stocks of scrap in New England are accumulating, but are by no means burdensome, and as a rule are in strong hands.

Fabricated Structural Steel

Awards in Good Volume—New Projects Lower

INCLUDING 12,000 tons for bridges at Grand Island, Niagara Falls, N. Y., fabricated steel lettings for the week totaled 19,300 tons. Ton-nages were mostly in small lots. New projects of 12,800 tons compare with 29,350 tons last week and 14,500 tons two weeks ago. The largest inquiry reported is 3000 tons for bridges at Henry and Spring Valley, Ill. Fabricated steel awards in September, at 83,752 tons, were the smallest for any month this year and compare with 61,600 tons in August. Structural steel lettings for the week follow:

NORTH ATLANTIC STATES

Landoff, N. H., 210 tons, State bridge, to Kittredge Bridge Co., Concord, N. H.

Vergennes, Vt., 180 tons, bridge, to B. A. Barton Construction Co., Ticonderoga, N. Y.

Phillips-Gardner, Me., 100 tons, State bridge, to Lackawanna Steel Construction Corp.

Niagara Falls, N. Y., 12,000 tons, Grand Island bridges; erection to Taylor-Fichter Steel Construction Co.

Little Falls, N. Y., 170 tons, State bridge, to American Bridge Co.

Baltimore, 130 tons, National Brewing Co. building, to Dietrich Brothers.

Hollow Field, Md., 105 tons, State bridge, to Pittsburgh-Des Moines Steel Co.

Baltimore, 620 tons, Refrigerating Steam Ship Lines building, to Dietrich Brothers.

SOUTH AND SOUTHWEST

Louisville, Ky., 100 tons, building, to International Steel & Iron Co., Evansville, Ind.

Gonzales, Tex., 100 tons, bridge, to Virginia Bridge & Iron Co.

White Pines, Tex., 475 tons, bridge, to Vincennes Bridge Co., Vincennes, Ind.

Bridgeport, Okla., 103 tons, highway bridge, to Missouri Valley Bridge & Iron Co.

Antlers, Okla., 425 tons, highway bridge, to Muskogee Iron Works.

Creed, Okla., 400 tons, bridge, to Kansas City Structural Steel Co.

State of Arizona, 270 tons, Salt River bridge, to Virginia Bridge & Iron Co., Inc.

CENTRAL STATES

Cleveland, 600 tons, incinerator building, to Fort Pitt Bridge Works Co.

Calumet, Ill., 8000 tons, sheet steel piling for Calumet breakwater, awarded by United States District Engineers to four steel piling manufacturers, one-half of the tonnage going to Steel Corporation mills.

Chicago, 700 tons, train sheds at La Salle Street station, to American Bridge Co.

Pekin, Ill., 200 tons, American Distilling Co., to Mississippi Valley Structural Steel Co.

Chicago, 150 tons, building, to Duffin Iron Works.

New London, Wis., 350 tons, grade separation, to Wisconsin Bridge & Iron Co., Milwaukee.

WESTERN STATES

Pasadena, Cal., 440 tons, spillway gates for Pine Canyon Dam, to Western Pipe & Steel Co.

Plumas County, Cal., 135 tons, Feather River bridge, to Virginia Bridge & Iron Co., Inc.

State of California, 686 tons, bridge over Russian River near Hopland, to Judson-Pacific Co.

Seibert, Colo., 130 tons, highway bridge, to American Bridge Co.

Carlsborg, Wash., 480 tons, highway bridge, to Pacific Car & Foundry Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

East Boston-Revere, Mass., 880 tons, four State bridges.

Medford, Mass., 400 tons, State bridge over Mystic River.

Cambridge, Mass., 350 tons, post office.

Brooklyn, 200 tons, addition to Central power plant.

Baltimore, 200 tons, garage for Johns Hopkins Hospital.

Washington, 515 tons, Howard University chemistry building.

SOUTH AND SOUTHWEST

Mobile, Ala., 500 tons, bridge.

Pensacola, Fla., 800 tons, hangar.

State of Oklahoma, 800 tons, four highway bridges; bids opened Oct. 3.

Apple Grove, W. Va., 2500 tons, Hogsett Locks.

CENTRAL STATES

Leavittsburg, Ohio, 535 tons, grade crossing elimination bridge; bids Oct. 6.

Springvalley and Henry, Ill., 3000 tons, bridges.

State of Wisconsin, 330 tons, Flambeau River bridge; C. R. Meyer & Sons Co., Oshkosh, Wis., low bidder on general contract.

Alma, Wis., 2500 tons, dam across Mississippi River; United Construction Co. low bidder on general contract, McClintic-Marshall Co. low bidder on structural steel.

Fountain City, Wis., 2500 tons, dam across Mississippi River; Merritt, Chapman, Whitney Construction Co. low bidder on general contract, Worden-Allen Co. low bidder on structural steel.

Iowa Falls, Iowa, 245 tons, State highway bridge.

Canton, Mo., 3600 tons, Mississippi River lock and dam, S. A. Healy Co., Detroit, low bidder on general contract.

Burlington Railroad, 600 tons, contemplated bridge program.

WESTERN STATES

Miles City, Mont., 350 tons, highway bridge.

Eagle County Colo., 250 tons, State highway structure; bids Oct. 5.

San Bernardino County, Cal., 122 tons, State highway paving; bids Oct. 8.

San Diego, Cal., 1000 tons, Navy assembly shop.

HAWAII

Pearl Harbor, 350 tons, foundry extension at Navy Yard; bids Nov. 15.

FABRICATED PLATE

AWARDS

Franklin, Pa., 150 tons, Atlantic Refining Co. tank, to Miles P. Brown, Franklin.

NEW PROJECTS

Lowell, Mass., 300 tons, brewery tanks.

Reinforcing Steel

Awards 7350 Tons—New Projects 2800 Tons

Landoff, N. H., 150 tons, State bridge, to Concrete Steel Co.

State of Rhode Island, 200 tons, road mesh; 100 tons to Truscon Steel Co. and 100 tons to American Steel & Wire Co.

Fulton and Westchester Counties, N. Y., 750 tons, road mesh, to Kalman Steel Corp.

Somerset County, N. J., 175 tons, road mesh, to Truscon Steel Co.

Nassau County, N. Y., 130 tons, bars for grade separation, to Concrete Steel Co.

Cleveland, 250 tons, incinerator plant, to Patterson-Leitch Co.

State of Wisconsin, 175 tons, road work, to Truscon Steel Co.

State of Wisconsin, 200 tons, road and bridge work, to an unnamed bidder.

Milwaukee, 100 tons, Government caisson work, to A. M. Castle & Co., Chicago.

Denver, 4150 tons, material for Bureau of Reclamation, 2800 tons to Colorado Fuel & Iron Products Co., 1350 tons to Pacific Coast Steel Corp.

State of Colorado, 355 tons, highway work in eight counties, to various bidders.

State of Arizona, 157 tons, four highway projects, to unnamed bidders.

State of Nevada, 100 tons, highway work in five counties, to unnamed bidders.

State of California, 273 tons, highway work in 15 counties, to various bidders.

United States Bureau Public Roads, 180 tons, five highway projects, to various bidders.

NEW REINFORCING BAR PROJECTS

Manchester, N. H., 150 tons, reservoir.

Medford, Mass., 116 tons, State bridge over Mystic River.

State of Rhode Island, 200 tons, road mesh; bids in.

New York, 237 tons, bars for midtown post office.

State of Ohio, 200 tons, bridges; bids Oct. 6.

Gallipolis, Ohio, 450 tons, dam.

Panama Canal Zone, 331 tons, general requirements, Schedule 2906.

Canton, Mo., 700 tons, Mississippi River lock and dam; S. A. Healy Co., Detroit, low bidder on general contract.

Coconino County, Ariz., 105 tons, two Bureaus of Public Roads projects; bids Oct. 10.

Eagle County, Colo., 101 tons, State highway structure; bids Oct. 5.

Eureka, Cal., 150 tons, Montgomery-Ward building; bids under advisement.

Los Angeles County, Cal., 100 tons, conduit on Verduga, Wash.; bids Oct. 9.

State of California, 171 tons, highway work in six counties; bids Oct. 18.

Ontario, Ore., 156 tons, linings and structures for Bureau of Reclamation; bids Oct. 25.

Los Angeles County, Cal., 217 tons, material for San Gabriel Dam No. 2; bids under advisement.

Railroad Equipment

Armour & Co. have ordered 500 refrigerator cars to be built in their own shops; steel underframes will be built by Pullman Car & Mfg. Corp.

Chicago Surface Lines have ordered one streamline noiseless street car from Pullman Car & Mfg. Corp., and a similar car from J. G. Brill Co.

St. Louis-San Francisco will dismantle 3000 obsolete freight cars.

Lehigh & New England will dismantle 335 box cars, and has sold 230 hopper and gondola cars for dismantling.

Steel Industry's Attitude Toward Labor Epitomized in E. T. Weir's Statement

IN dealing with the first major strike in the steel industry since the adoption of the code, E. T. Weir, chairman, National Steel Corp., Pittsburgh, has probably summed up the attitude of the industry toward unwarranted labor troubles. In a statement to the employees of the Weirton Steel Co., National Steel subsidiary, the plant of which is almost completely closed by a strike, Mr. Weir said:

The Weirton Steel Co. is operating according to the hours, rates of pay and conditions of employment prescribed by the President, and some of them are more favorable to the employees than those of some of our competitors, and none of them is less favorable.

We have never employed or discharged a man because of his organization connections and our company will never make it a requirement of any employee that he belong to any organization or that he does not belong to any organization. We believe that it is better for the company and the employees that the latter have their own organization within the company, but we have never made that a requirement of employment with us and do not intend to do so. No employee will be discharged because of his failure to join any organization.

In accordance with the privilege granted to employees under the N.R.A., the men working for us elected by secret ballot committees to represent them for collective dealing with the company. The nominations for the committees were made secretly by the employees. Three times the number to be elected were placed on the ballot as a result of nominations made by the men, and from this number committees were chosen by secret ballot. An average of over 85 per cent of all employees participated in the selection of these committees, and in the mill where this strike started over 90 per cent of the men made the selection of the committee. The committees were recognized by the company and have dealt with the company in 181 different matters that have come up since their organization, pertaining to wages, hours and working conditions. There has been no matter brought to the attention of the company by the committees which has not received prompt attention, and all such matters have been adjusted satisfactorily to both parties.

On Sept. 24, 1933, without any warning to the company, or without any notice or demand upon the company of any kind, a number of men quit working in the tin plate cold-rolled department and others joined them in the walk-out later. The result of it was that certain parts of the mill were so completely tied up that it was necessary to close all the mills down, and they are not now operating except for emergency work. A day or so later a group of men, purporting to be a committee of the strikers, asked us to negotiate with them as representatives of the employees, instead of the duly elected committees.

Our duty under the N.R.A. is clear. We must recognize the committees which have been selected and cannot be expected to negotiate with any other committee which happens to present itself. Under the

N.R.A., our employees are free to select committees of their own choosing, whether made up of employees or not, but once the committees have been selected, we must recognize those committees. If the company begins the practice of negotiating with any committee that presents itself, it will not be complying with the provisions of the code which it has signed and its covenants with the President, and it is apparent that great confusion might result if several committees present themselves to negotiate with us.

It has always been our policy, however, to hear any committee of our own employees, and we will continue that policy. Any complaint or grievance may be presented to us by any individual or group of employees, but all negotiations or collective bargaining must be with the committees selected. Any other procedure on our part would be a violation of our covenants under the code.

We regret that the action of a small number of our employees has made it impossible for the others to continue working. We realize that the large majority of our employees would like to continue working without interference by the others. We have worked diligently during the depression to keep our men employed and to distribute the work fairly among them, and we know that the large majority of our employees appreciate our efforts and are entirely satisfied with wages and working conditions in our plants. We have received no complaints of any kind with relation to any of these matters. We are observing every provision of the N.R.A. and it is unfortunate that a small group of employees should deprive thousands of men from working and thus defeat the very purpose the President of the United States had in mind in signing the steel code. We believe, however, that our loyal employees will recognize the unfairness of the position taken by the instigators of the present strike. We believe the large majority of our employees are anxious to comply with the codes and regulations issued by President Roosevelt and will heartily support us in our adherence to our obligations under the code and repudiate the efforts of the instigators of this strike.

Canadian Iron and Steel Trade Improving

TORONTO, ONT., Oct. 3.—Business in the Canadian iron and steel industry is beginning to show improvement. While no large tonnage contracts have been booked recently, there is a steady flow of orders for spot delivery.

Algoma Steel Corp., Sault Ste. Marie, Ont., on Sept. 25, started up two open-hearth furnaces, and later in the week resumed operation of its 12 and 18-in. mills.

Steel Co. of Canada, Ltd., Hamilton, Ont., is holding operations at about 35 per cent of capacity.

Pig iron business is gaining slowly. Melters are entering the market at

frequent intervals and some orders are running to larger tonnage than formerly. Sales are said to have been made recently to the agricultural implement industry, which has increased operations within the past month.

Trading in scrap is specialized. Canadian consumers are largely interested in iron grades and are not buying steel scrap in a large way. Mills are out of the market and no shipments are being made to the Hamilton area. Dealers, however, report a good demand for steel scrap for export.

Coast Market Featured by Boulder Dam Award

SAN FRANCISCO, Oct. 2.—The new schedule of mill quotations shows that the base prices on plates and shapes have been raised 10c. a 100 lb. while the base on bars has been increased 15c. Plates and standard shapes are now listed at 2.25c. and bars at 2.30c. a lb., f.o.b. cars on dock at Pacific ports. These advances are attributed to increased operating costs rather than to heavier demand. Warehouse prices will be raised correspondingly.

Activity during the week has been confined to lettings for highway work. Bookings included 741 tons of structural steel and 5297 tons of reinforcing bars. The outstanding reinforcing award was 4000 tons placed by the Bureau of Reclamation, Denver, Colo., for work at Boulder Dam. New inquiries were limited to 783 tons of shapes and 1120 tons of bars.

Detroit Scrap Prices Off Further

DETROIT, Oct. 3.—Heavy melting steel, hydraulic compressed sheets and sheet clips have declined another 25c. a ton. In fact, the entire list of scrap items is showing a softening tendency. Steel mills continue to hold up contract shipments, and the local steel company is still manifesting no interest in making further scrap purchases.

Pipe Lines

Marfa, Tex., plans steel pipe line, about 40,000 lin. ft., for natural gas distribution. Booster plant and other equipment for commercial service will be installed. Cost about \$100,000.

Northern Natural Gas Co., Rochester, Minn., has secured gas franchise at Rosemount, Minn., and plans installation of steel pipe line for distribution.

Princed George's Gas Corp., Washington, recently organized subsidiary of Washington Gas Light Co., 411 Tenth Street, N. W., plans steel pipe line for distribution in Prince George's County, Md., where artificial gas holder and distributing plant will be located. Entire project will cost about \$675,000.

Rockport, Tex., plans natural gas steel pipe line system. Financing in amount of \$30,000 is being arranged.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 10 for welded iron pipe (Schedule 787) for Annapolis Navy Yard.

OBITUARY

CHARLES PIEZ, who until his retirement in April was chairman of the board of the Link-Belt Co., Chicago, died of pneumonia at a Washington hospital on Oct. 2. He was born in Mainz, Germany, on Sept. 24, 1866. While he was a boy his parents emigrated to the United States. He attended public schools in New York and was graduated from the School of Mines, Columbia University, in 1889. Immediately after leaving col-



CHARLES PIEZ

lege he entered the employ of the Link-Belt Engineering Co., Philadelphia, as an engineer draftsman. With the growth of the company he held successively the positions of chief engineer, general manager, and vice-president until 1906, when the company was merged with two affiliated companies, forming the Link-Belt Co., of which Mr. Piez was elected president.

Largely as a result of his fame as an organizer, Mr. Piez was selected in November, 1917, as vice-president and general manager of the United States Shipping Board Emergency Fleet Corporation. He was later appointed director-general. On May 1, 1919, he resigned from the Emergency Fleet Corporation to return to his private business. He continued as president of the Link-Belt Co. until 1924, when he became chairman of the board. Mr. Piez was a member of a number of technical societies, among them the American Society of Mechanical Engineers, of which he was elected president in 1929, the American Institute of Mining and Metallurgical Engineers, and the Western Society of Engineers. In addition to personal and professional achievements, Mr. Piez was active in rendering public service. He was a member of the commission that developed the Illinois Factory Act in 1909, and the following year acted as chairman of the Illinois Workmen's Compensation Commission.

JACOB M. SPITZGLASS, vice-president and mechanical engineer of the Republic Flow Meters Co., Chicago, died Oct. 1, aged 64 years. He was born in Russia and came to this country in 1904. He was the inventor of an electrical device which records the flow of fluids in pipes and also of a gas burner which is used extensively in domestic heating units. For his inventions he had been awarded the Edward Longstreth medal.

LEIGH H. ELLIOT, for 40 years connected with the iron and steel industry in Cleveland, died at his home in Gates Mills, Ohio, Sept. 26, aged 73 years. Born in Bloomingburg, Ohio, he went to Columbus at the age of 20 and was employed by a blast furnace plant which later was operated by the Columbus & Hocking Valley Coal & Iron Co. In 1893 he became connected with Condit-Fuller & Co., in Cleveland, which in 1896 became the Bourne-Fuller Co. Mr. Elliot was associated with this company, holding positions of secretary-treasurer and later vice-president until its absorption by the Republic Steel Corp. in 1930. He remained with the Republic organization about one year.

HENRY M. QUACKENBUSH, founder and for many years president of the H. M. Quackenbush Co., Herkimer, N. Y., died at his home in that city on Sept. 7, aged 86 years. He gained his early mechanical experience with the Remington Arms Co. at Ilion, N. Y., as a machine hand and later as a toolmaker. He founded his own company in 1871.

JOHN CLIFTON HENDERSON, for the past 20 years consulting engineer for the Driver-Harris Co., Harrison, N. J., died in the Elizabeth, N. J., General Hospital on Sept. 25, aged 56 years. He held 30 or more patents, including one on cast carburizing containers made of Nichrome.

HENRY M. JONES, president of the Megquier & Jones Co., Portland, Me., died on Sept. 20.

RICHARD G. HARTSHORNE, sales manager of the New England Structural Co., died of heart disease on Sept. 26 at the Peter Bent Brigham Hospital, Boston. He was 52 years of age and was graduated from the Massachusetts Institute of Technology in 1904.

DR. FRED K. PRIEST, manager of the American Shearer Co., Nashua, N. H., died at his home in that city on Sept. 28. He was born in Nashua, Oct. 12, 1860, was graduated from New York University in the class of 1882, and for 10 years practiced in New York. His father then called him to Nashua to take charge of the business.

HOWARD BEECHER TUTTLE, chairman of the board of the Eastern Mal-

leable Iron Co., Naugatuck, Conn., died at his home on Sept. 29, after a short illness. He was 70 years old.

THORVAL L. RYERSON, president, the W. D. Allen Mfg. Co., Chicago, died Sept. 27, at his home in Park Ridge, Ill. Mr. Ryerson was a member of a number of clubs and was active in Park Ridge civic affairs.

J. GEORGE SHAW, prominent in the steel casting industry in Milwaukee for many years, died Sept. 26, aged 67 years. He was born in Middlesboro, England, and came to America in 1887, entering the industry as a molder with the E. P. Allis Co., fore-runner of the Allis-Chalmers Mfg. Co. In 1905 he established the Milwaukee Steel Casting Co. He disposed of the business in 1919 and retired.

LORENZ FRANKFURTH, president of the Frankfurth Hardware Co., Milwaukee, died of heart disease on Sept. 28, aged 61 years. He was born in Milwaukee, the grandson of the late William Frankfurth, founder of the concern, one of the oldest and largest in the wholesale hardware field in the Central West.

Cast Iron Pipe

State of Massachusetts has awarded 200 tons for a Bridgewater job to United States Pipe & Foundry Co.

State of New York is inquiring for 400 tons of 3 to 36-in., for water and sewer lines at Rome, Ithaca, and Donnemora; bids will be opened within next two weeks.

Hawthorne, N. J., plans 6-in. water line in Mountain Avenue. Cost about \$10,000.

Greensburg, Ky., let contract to United States Pipe & Foundry Co. for 225 tons pipe and fittings for water system.

McEwen, Tex., plans pipe line for water distribution and station facilities. Cost about \$40,000.

Miami, Fla., asks bids until Nov. 1 for 47,500 ft. of 24 to 36-in.; also for 350-hp. watertube boiler, two steam turbine units and other equipment for municipal waterworks. Charles S. Nichols, Courthouse Building, is city engineer.

Milwaukee has awarded 150 tons for a sewage treating plant to James B. Clow & Sons.

Milwaukee Park Board has placed 9270 ft. of 10-in., Class B with United States Pipe & Foundry Co.

Flushing, Mich., plans pipe line system in connection with waterworks extensions and improvements. Cost about \$30,000. Financing is being arranged. Francis Engineering Co., Eddy Building, Saginaw, Mich., is consulting engineer.

Rockville, Minn., plans about 6500 ft. of 4 and 8-in. for extensions in water system. Entire project will cost \$24,000.

Auburn, Wash., plans about three miles of 6-in., in connection with waterworks extensions and improvements. Cost \$27,125. Financing is being arranged.

Kings County Water District, Seattle, plans about 45 miles of 3, 4 and 6-in., with part of line 12-in. Cost about \$130,000. Parker-Hill, Inc., Smith Tower Building, is consulting engineer.

Cleveland has awarded 5400 tons for waterworks extensions to J. B. Clow & Sons, and 6600 tons to United States Pipe & Foundry Co.

Moderate Buying of Lead Continues— Zinc Sales at 4.75c. Total 7300 Tons

Tin Has Better Tone; Improves as Statistics Indicate Heavy American Shipments—Electrolytic Inactive But Firm at 9c.

NEW YORK, Oct. 3.—Domestic trading in electrolytic copper is confined to scattered bookings at a firm price of 9c. a lb., delivered Connecticut Valley. Resale activity at shaded levels is of insufficient volume to influence the market. Producers are generally unwilling to book beyond January, but custom smelters are included to take the entire first quarter position. Shipments against old contracts are in good volume, but buyers apparently are awaiting codification developments in order to guide their purchasing policy. Custom smelters and producers reached an impasse on the retention of the "weighted average selling price" in the code, and the disputed point is being investigated at Washington. Since the weighted price is advocated by producers who represent 85 per cent of the industry, it is expected to prevail, although an optional plan of impounding stocks may be accepted. In either case, quotations would

strengthen upon acceptance of the code.

Since last Thursday selling abroad has been vigorous at price levels ranging from 8c. to 8.30c. a lb., c.i.f. usual Continental ports. Bookings were made today at 8.50c. American interests are meeting the competition set by African producers.

Tin

Contraction of the world's visible stocks, resulting from heavy September shipments, together with the general expectation of a further decrease during October, has improved the tone of the tin market, but has failed to stimulate consumer buying. Bookings of Straits during the week were extremely light, at price levels ranging 80 points on either side of 38c. a lb., New York. On first call in London today, sales of spot Straits were recorded at £227 17s. 6d., and New York metal was available at 48.62½c. Light sales of standard metal were

made at £221 2s. 6d. in London. Reported stocks here have risen to 2900 tons, as consumers continue to take shipments against contracts made during the low-price period in anticipation of business improvement. English observers generally expect the cartel to liberalize production quotas in order that smelters' stocks may be replenished. If no action is taken, it is estimated that the world supply will approach 25,000 tons by the end of the year.

Zinc

The current market for spelter is very quiet with prices firm at 4.75c. a lb., East St. Louis and 5.12c., New York. Producers have opened December books, but consumers are showing no interest in positions beyond November. Sales last week aggregated 7300 tons, practically all of which was booked at 4.75c., but some forward positions were made at 4.80c. The announcement of this large selling volume came as a distinct surprise to the trade as the market last week was apparently very quiet. The Joplin ore market continues to hold firmly at \$31 a ton, for all grades. Production dropped to 6300 tons, which was considerably above the current demand of smelters. Shipments totaled 4500 tons, and the visible stock surplus dropped to 1800 tons. In the absence of a stronger tone in the Tri-State district it is not expected that the Prime Western position will harden within the next week.

Lead

Consumer purchases are irregular and in moderate volume following the active buying of the past three weeks. Several producers have already booked October metal in excess of September tonnage, and estimated requirements for November are less than 35 per cent covered. The trade expects forthcoming statistics to show September shipments considerably in excess of production, thereby materially reducing stocks for the third successive month. The current volume of shipments is assumed to designate actual sustained consumption, and several producers have increased operations in order to add to their stocks. Agitation for definite action on currency inflation is not believed to have forced in bookings of speculative metal. Domestic quotations are firm at 4.35c. a lb., East St. Louis, but unabated consumer interest, coupled with the high domestic parity of the London market, is exerting a strengthening influence on the market.

The average prices of the major non-ferrous metals for September, based on daily quotations in the *THE IRON AGE*, are as follows:

	Average
Electrolytic copper, N. Y.	8.750c. a lb.
Lake copper, New York	9.000c. a lb.
Straits tin, Spot, N. Y.	46.658c. a lb.
Zinc, East St. Louis	4.702c. a lb.
Zinc, New York	5.072c. a lb.
Lead, St. Louis	4.350c. a lb.
Lead, New York	4.500c. a lb.

*Refinery quotations; price ¼c. higher delivered in Connecticut.

The Week's Prices. Cents Per Pound for Early Delivery

	Sept. 27	Sept. 28	Sept. 29	Sept. 30	Oct. 2	Oct. 3
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75	8.75
Lake copper, New York	9.00	9.00	9.00	9.00	9.00	9.00
Straits tin, Spot, N. Y.	47.25	43.37½	48.37½	48.37½	48.87½	48.62½
Zinc, East St. Louis	4.75	4.75	4.75	4.75	4.75	4.75
Zinc, New York	5.12	5.12	5.12	5.12	5.12	5.12
Lead, St. Louis	4.35	4.35	4.35	4.35	4.35	4.35
Lead, New York	4.50	4.50	4.50	4.50	4.50	4.50

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 7.00c. a lb., New York.
Brass ingots, 85-5-5-5, 9c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	49.75c. to 50.75c.
Tin, bar	51.75c. to 52.75c.
Copper, Lake	10.50c. to 11.25c.
Copper, electrolytic	10.25c. to 10.75c.
Copper, castings	10.00c. to 11.00c.
*Copper sheets, hot-rolled	17.12½c.
*High brass sheets	14.75c.
*Seamless brass tubes	16.37½c.
*Seamless copper tubes	16.62½c.
*Brass rods	12.25c.
Zinc, slabs	6.00c. to 7.00c.
Zinc sheets (No. 9), casks	9.75c. to 10.00c.
Lead, American pig	5.50c. to 6.50c.
Lead, bar	7.00c. to 8.00c.
Lead, sheets	8.25c.
Antimony, Asiatic	8.50c. to 9.50c.
Alum., virgin, 99 per cent plus	23.30c.
Alum. No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	30.00c. to 31.00c.
Babbitt metal commercial grade	25.00c. to 50.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	51.75c.
Tin, bar	53.75c.

Copper, Lake	10.25c.
Copper, electrolytic	10.25c.
Copper, casting	10.00c.
Zinc, slab	6.00c. to 6.25c.
Lead, American pig	5.35½c. to 5.50c.
Lead, bar	8.50c.
Antimony, Asiatic	9.00c.
Babbitt metal, medium grade	19.50c.
Babbitt metal, high grade	57.00c.
Solder, ½ and ½	29.75c.

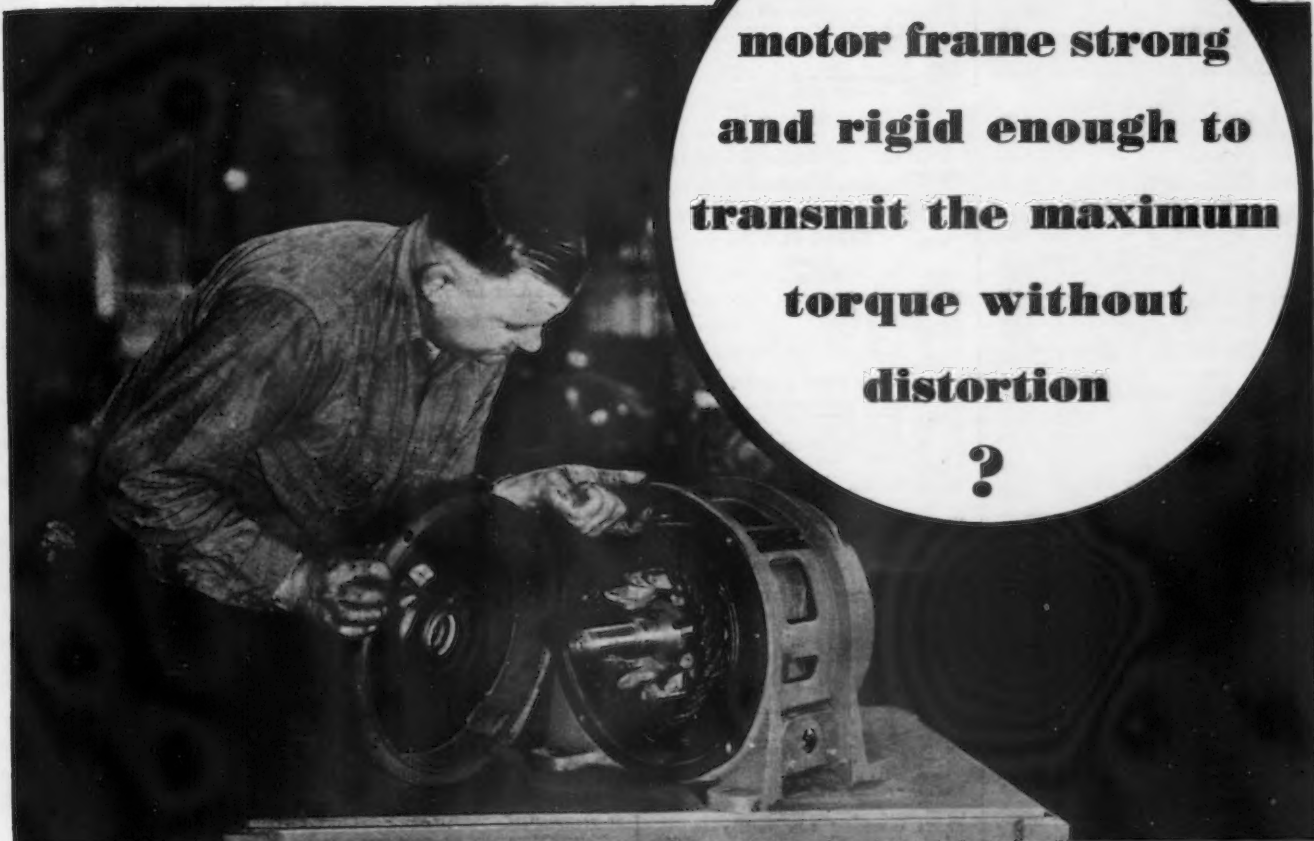
Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.00c.	8.00c.
Copper, hvy. and wire	6.75c.	7.75c.
Copper, light and bottoms	5.75c.	6.25c.
Brass, heavy	3.75c.	4.50c.
Brass, light	3.50c.	3.75c.
Hvy. machine composition	5.25c.	6.00c.
No. 1 yel. brass turnings	5.00c.	5.625c.
No. 1 red brass or compos. turnings	5.00c.	5.50c.
Lead, heavy	3.50c.	3.875c.
Zinc	2.75c.	3.00c.
Cast aluminum	7.50c.	8.75c.
Sheet aluminum	11.50c.	13.00c.

Ask this Question before you buy

**Is the
motor frame strong
and rigid enough to
transmit the maximum
torque without
distortion
?**



Don't take it for granted. Take the bearing bracket off and look at the frame thickness.

THE unit cast frame of Westinghouse CS Induction Motors effectively resists distortion... even when subjected to stresses far in excess of any ever encountered in the most severe service. It is a rigid, unbending "backbone" for the motor.

To this powerful frame... fitted snugly to its heavy flanges, and held securely by large-diameter bolts... are fastened the cast bearing brackets which are maintained in true concentric position by a machined rabbet fit.

Think what this unyielding construction means to your motor performance! It positively prevents distortion, maintains uniform air gap and assures accurate bearing alignment.

It means freedom from serious motor troubles and high maintenance costs caused by frame distortion.

Other features that add to motor life and lower upkeep include: Sealed Sleeve Bearings, taped end turns, the pre-wound core and pressure-cast rotors. And remember, all CS motors can be supplied with Thermoguard protection from overheating under abnormal operating conditions.

For additional information, write the nearest Westinghouse office, consult your local Westinghouse franchised Industrial Electrical Contractor, or address Westinghouse Electric & Manufacturing Company, Room 2-N, East Pittsburgh, Pennsylvania.

One of a series of Westinghouse advertisements discussing points of design and construction that vitally affect motor life and performance.

Westinghouse 

T 79741

Quality workmanship guarantees every Westinghouse product

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES Iron and Steel Bars Soft Steel

Base per Lb.	
F.o.b. Pittsburgh mill	1.75c
F.o.b. Chicago or Gary	1.80c
Del'd Philadelphia	2.04c
Del'd New York	2.08c
F.o.b. Cleveland	1.80c
F.o.b. Buffalo	1.85c
F.o.b. Birmingham	1.90c
F.o.b. cars dock Pacific	2.30c
F.o.b. cars dock Gulf ports	2.15c

Base per Lb.	
F.o.b. Cleveland	1.70c
F.o.b. Chicago	1.70c
F.o.b. Gary	1.70c
F.o.b. Pittsburgh	1.65c
F.o.b. Buffalo	1.75c
F.o.b. Birmingham	1.80c

Base per Lb.	
F.o.b. P'gh mills	1.80c
F.o.b. Birmingham	1.85c
F.o.b. Buffalo	1.85c
F.o.b. Cleveland	1.85c
F.o.b. Youngstown	1.85c
F.o.b. Chicago or Gary	1.85c
F.o.b. cars dock Pacific	2.35c
F.o.b. cars dock Gulf ports	2.20c

Base per Lb.	
F.o.b. Pittsburgh	1.75c
F.o.b. Cleveland	1.80c
F.o.b. Chicago	1.80c

Base per Lb.	
Common iron, f.o.b. Chicago	1.60c
Redfin iron, f.o.b. P'gh mills	2.75c
Common iron, del'd Phila.	1.74c
Common iron del'd New York	1.90c

Base per Lb.	
F.o.b. Pittsburgh	2.50c
F.o.b. Chicago	2.50c

Base per Lb.	
F.o.b. Pittsburgh mill	1.70c
F.o.b. Chicago	1.75c
F.o.b. Gary	1.75c
F.o.b. Birmingham	1.85c
F.o.b. Buffalo	1.85c
Del'd Cleveland	1.885c
Del'd Philadelphia	1.885c
F.o.b. Coatesville	1.885c
F.o.b. Sparrows Point	1.885c
Del'd New York	1.98c
F.o.b. dock cars Pacific	2.25c
F.o.b. cars dock Gulf ports	2.10c
Wrought iron plates, f.o.b. P'gh.	3.00c

Base per Lb.	
F.o.b. Pittsburgh	3.20c
F.o.b. Chicago	3.25c

Base per Lb.	
F.o.b. Pittsburgh mill	1.70c
F.o.b. Chicago	1.75c
F.o.b. Birmingham	1.85c
F.o.b. Buffalo	1.85c
F.o.b. Bethlehem	1.80c
Del'd Cleveland	1.885c
Del'd Philadelphia	1.9025c
F.o.b. cars dock Gulf ports	2.10c
F.o.b. dock cars Pacific ports (stand- ard)	2.25c
F.o.b. dock cars Pacific ports (wide flange)	2.35c

Base per Lb.	
F.o.b. Pittsburgh	1.90c
F.o.b. Chicago mill	2.00c
F.o.b. Buffalo	2.00c

Base per Lb.	
F.o.b. Pittsburgh, Chicago, Buffalo, Beth- lehem, Massillon or Canton	2.45c
Open-hearth grade, base, 2.45c, a lb. ex- cept at Bethlehem where the price is 2.55c, S.A.E.	
Series	Differential
Numbers	per 100 Lb.
2000 (1/4% Nickel)	\$0.25
2100 (2/4% Nickel)	0.55
2300 (3/4% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Vanadium	1.20
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Base per Lb.	
F.o.b. Pittsburgh	1.90c
F.o.b. Chicago mill	2.00c
F.o.b. Buffalo	2.00c

Base per Lb.	
F.o.b. Pittsburgh, Chicago, Buffalo, Beth- lehem, Massillon or Canton	2.45c
Open-hearth grade, base, 2.45c, a lb. ex- cept at Bethlehem where the price is 2.55c, S.A.E.	
Series	Differential
Numbers	per 100 Lb.
2000 (1/4% Nickel)	\$0.25
2100 (2/4% Nickel)	0.55
2300 (3/4% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Vanadium	1.20
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Base per Lb.	
F.o.b. Pittsburgh	1.90c
F.o.b. Chicago mill	2.00c
F.o.b. Buffalo	2.00c

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F.o.b. Chicago mill	2.00c
F.o.b. Buffalo	2.00c

Base per Lb.	
F.o.b. Pittsburgh	1.90c
F.o.b. Chicago mill	2.00c
F.o.b. Buffalo	2.00c

billets and slabs under 4x4 in. or equiv-
alent are sold on the bar base. Slabs with
a section area of 16 in. and 2 1/2 in. thick
or over take the billet base. Sections 4x4
in. to 10x10 in. or equivalent carry a
gross ton price, which is the net price for
bars for the same analysis. Larger sizes
carry extras.

Base per Lb.	
F.o.b. Pittsburgh mill	1.95c
F.o.b. Chicago	2c
F.o.b. Cleveland	2c
F.o.b. Buffalo	2c
F.o.b. Detroit	2.15c
F.o.b. eastern Michigan	2.20c
Shafting, ground, f.o.b. mill	

Base per Lb.	
1-3/16 to 1 1/4 in. 3.25c	
1-9/16 to 1 1/2 in. 2.60c	
1-15/16 to 2 1/4 in. 2.45c	
2-15/16 to 6 in. 2.30c	

* In quantities of 10,000 to 19,999 lb.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Base per Lb.	
F.o.b. Pittsburgh mill	1.75c
F.o.b. Chicago	1.85c
F.o.b. Gary	1.85c
F.o.b. del'd Phila.	2.04c
F.o.b. Birmingham	1.90c
F.o.b. dock cars Pacific	2.42 1/2 c

Base per Lb.	
F.o.b. Pittsburgh	2.25c
F.o.b. Gary	2.35c
F.o.b. del'd Phila.	2.54c
F.o.b. Birmingham	2.40c
F.o.b. dock cars Pacific	2.95c
F.o.b. wrought iron, Pittsburgh	4.30c

Base per Lb.	
F.o.b. Pittsburgh	2.25c
F.o.b. Gary	2.35c
F.o.b. del'd Phila.	2.54c
F.o.b. Birmingham	2.40c
F.o.b. dock cars Pacific	2.95c
F.o.b. wrought iron, Pittsburgh	4.30c

Base per Lb.	
F.o.b. Pittsburgh	2.25c
F.o.b. Gary	2.35c
F.o.b. del'd Phila.	2.54c
F.o.b. Birmingham	2.40c
F.o.b. dock cars Pacific	2.95c
F.o.b. wrought iron, Pittsburgh	4.30c

Base per Lb.	
F.o.b. Pittsburgh	2.25c
F.o.b. Gary	2.35c
F.o.b. del'd Phila.	2.54c
F.o.b. Birmingham	2.40c
F.o.b. dock cars Pacific	2.95c
F.o.b. wrought iron, Pittsburgh	4.30c

Base per Lb.	
F.o.b. Pittsburgh	2.25c
F.o.b. Gary	2.35c
F.o.b. del'd Phila.	2.54c
F.o.b. Birmingham	2.40c
F.o.b. dock cars Pacific	2.95c
F.o.b. wrought iron, Pittsburgh	4.30c

Base per Lb.	
F.o.b. Pittsburgh	2.25c
F.o.b. Gary	2.35c
F.o.b. del'd Phila.	2.54c
F.o.b. Birmingham	2.40c
F.o.b. dock cars Pacific	2.95c
F.o.b. wrought iron, Pittsburgh	4.30c

Base per Lb.	
F.o.b. Pittsburgh	2.25c
F.o.b. Gary	2.35c
F.o.b. del'd Phila.	2.54c
F.o.b. Birmingham	2.40c
F.o.b. dock cars Pacific	2.95c
F.o.b. wrought iron, Pittsburgh	4.30c

Base per Lb.	
F.o.b. Pittsburgh	2.25c
F.o.b. Gary	2.35c
F.o.b. del'd Phila.	2.54c
F.o.b. Birmingham	2.40c
F.o.b. dock cars Pacific	2.95c
F.o.b. wrought iron, Pittsburgh	4.30c

Base per Lb.	
F.o.b. Pittsburgh	2.25c
F.o.b. Gary	2.35c
F.o.b. del'd Phila.	2.54c
F.o.b. Birmingham	2.40c
F.o.b. dock cars Pacific	2.95c
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F.o.b. dock cars Pacific	2.95c
F.o.b. wrought iron, Pittsburgh	4.30c

Base per Lb.	
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F.o.b. Gary	2.35c
F.o.b. del'd Phila.	2.54c
F.o.b. Birmingham	2.40c
F.o.b. dock cars Pacific	2.95c
F.o.b. wrought iron, Pittsburgh	4.30c

Base per Keg	
Standard wire nails	\$2.10
Smooth coated nails	2.10
Galvanized nails	3.60

Base per 100 Lb.	
Smooth annealed wire	\$2.25
Smooth galvanized wire	2.60
Polished staples	3.05
Galvanized staples	2.60
Harbed wire, galvanized	2.60
Woven wire fence, base column	55.00

Chicago and Anderson, Ind., mill prices
are \$1 a ton over Pittsburgh base (on all
products except woven wire fence, for which
the Chicago price is \$2 above Pittsburgh);
Duluth, Minn., and Worcester, Mass., mill
prices are \$2 a ton over Pittsburgh (ex-
cept for woven wire fence, at Duluth
which is \$5 over Pittsburgh), and Bir-
mingham mill prices are \$3 a ton over
Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills	
Steel	Wrought Iron

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills	
Steel	Wrought Iron

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Steel	Wrought Iron

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Steel	Wrought Iron

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Steel	Wrought Iron

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills	
Steel	Wrought Iron

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills	
Steel	Wrought Iron

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills	
Steel	Wrought Iron

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills	
Steel	Wrought Iron

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills	
Steel	Wrought Iron

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills	
Steel	Wrought Iron

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills	
Steel	Wrought Iron

gages take the mechanical tube list
discounts. Intermediate sizes and
not listed take price of next larger
diameter and heavier gage.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	\$35.00
Cleveland	35.00
Chicago	36.00
Birmingham	38.00
Youngstown (del'd)	38.00

ALLOY STEEL BLOOMS, BILLETS AND SLABS

Fab. Pittsburgh, Chicago, Buffalo, Hamilton, Canton or Bethlehem. Base price, \$19 a gross ton except at Bethlehem, where it is \$21.

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Pomery, f.o.b. Connellsville	\$2.50 to \$2.75
Pomery, f.o.b. Connellsville	8.25 to 4.50
Pomery, by-product, Chicago	8.00
Pomery, by-product, delivered in Chicago switching district	8.75
Pomery, by-product, New England, delivered	10.50
Pomery, by-product, Newark or Jersey City, del'd	8.30 to 8.81
Pomery, by-product, Phila.	8.50
Pomery, by-product, Cleveland, delivered	8.76
Pomery, Birmingham	5.00
Pomery, by-product, St. Louis, f.o.b. ovens	9.00
Pomery, by-product, del'd St. Louis	9.00

Coal (Nominal)

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$2.00
Mine run coking coal f.o.b. W. Pa.	1.75 to 2.25
Gas coal, 1/2 in., f.o.b. Pa. mines	2.00 to 2.50
Mine run gas coal, f.o.b. Pa. mines	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines	85c. to 1.00
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.25

Fuel Oil

	Per Gal. f.o.b. Bayonne, N. J.
No. 1 distillate	4.00c.
No. 4 industrial	3.50c.
	Per Gal. f.o.b. Baltimore
No. 1 distillate	4.00c.
No. 4 industrial	3.50c.
	Per Gal. del'd Chicago
No. 1 industrial fuel oil	3.73c.
No. 3 industrial fuel oil	3.23c.
	Per Gal. f.o.b. Cleveland
No. 1 distillate	5.50c.
No. 4 industrial	5.00c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works
High-heat, intermediate	Duty Brick
Pennsylvania	\$45.00
Indiana	45.00
New Jersey	55.00
Ohio	45.00
Kentucky	45.00
Missouri	45.00
Illinois	45.00
Ground fire clay, per ton	7.00

Chrome Brick

	Per Net Ton
Standard size	\$15.00

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	\$45.00
Indiana	51.00
Birmingham	55.00
Slime clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	\$65.00
Unburned, f.o.b. Baltimore	\$2.00
Crude magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

CAST IRON PIPE

	Per Net Ton
4 in. and larger, del'd Chicago	\$42.00 to \$44.00
4 in., del'd Chicago	46.00 to 47.00
4 in. and larger, del'd New York	38.00
4 in., del'd New York	42.00
4 in. and larger, Birmingham	\$25.00 to \$26.00
4 in., Birmingham	38.00 to 39.00
Class "A" and gas pipe, \$3 extra.	

Pig Iron, Ores, Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	\$18.00	\$18.50	\$17.50	\$19.00
Bethlehem, Pa.	17.50	18.00	17.00	18.50
Birdsboro, Pa.	17.50	18.00	17.00	18.50
Swedeland, Pa.	17.50	18.00	17.00	18.50
Sparrows Point, Md.	17.50	18.00	17.00	18.50
Neville Island, Pa.	18.00	18.00	17.50	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown	17.50	17.50	17.00	18.00
Buffalo	17.50	18.00	16.50	18.50
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, Ohio	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
Hamilton, Ohio	17.50	17.50	17.00	18.00
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	18.50
Duluth, Minn.	18.00	18.00	17.00	18.50
Birmingham	18.50	18.50	17.50	19.00
Provo, Utah	16.50	16.50	16.50	17.50

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston and nearby New England	\$18.50	\$19.00	\$18.00	\$19.50
From Everett, Mass.	18.50	19.00	18.00	19.50
From Buffalo	18.50	19.00	18.00	19.50
Brooklyn	19.77	20.27	19.27	20.77
From East. Pa. or Buffalo	19.77	20.27	19.27	20.77
Newark or Jersey City, N. J.	18.89	19.39	18.39	19.89
From East. Pa. or Buffalo	18.89	19.39	18.39	19.89
Philadelphia	18.26	18.76	17.76	19.26
From Eastern Pa.	18.26	18.76	17.76	19.26
Cincinnati	18.51	18.51	18.01	19.01
From Hamilton, Ohio	18.51	18.51	18.01	19.01
Canton, Ohio	18.76	18.76	18.01	19.01
From Cleveland and Youngstown	18.76	18.76	18.01	19.01
Columbus, Ohio	19.50	19.50	18.01	19.01
From Hamilton, Ohio	19.50	19.50	18.01	19.01
Mansfield, Ohio	19.26	19.26	18.01	19.01
From Cleveland and Toledo	19.26	19.26	18.01	19.01
Indianapolis	19.77	19.77	18.01	19.01
From Hamilton, Ohio	19.77	19.77	18.01	19.01
South Bend, Ind.	19.55	19.55	18.01	19.01
From Chicago	19.55	19.55	18.01	19.01
Milwaukee	18.50	18.50	18.01	19.01
From Chicago	18.50	18.50	18.01	19.01
St. Paul	19.44	19.44	18.01	19.01
From Duluth	19.44	19.44	18.01	19.01
Davenport, Iowa	19.26	19.26	18.01	19.01
From Chicago	19.26	19.26	18.01	19.01
Kansas City	20.04	20.54	18.01	19.01
From Granite City	20.04	20.54	18.01	19.01

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa. and Standish, N. Y.	\$22.00
Johnson City, Tenn.	22.00
F.o.b. Valley furnace	22.00
Del'd Chicago	27.65

GRAY FORCE PIG IRON

Valley furnace	\$17.50
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CHARCOAL PIG IRON

Lake Superior furnace	\$20.50
Delivered Chicago	23.54
Delivered Buffalo	23.78

CANADA

Pig Iron

Per gross ton:	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard, (carloads)	\$82.00
Domestic, 80%, seaboard, (less carloads)	89.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	\$27.00

Electric Ferroalloy

	Per Gross Ton Delivered
50% (carloads)	\$74.50
50% (less carloads)	82.00
75% (carloads)	120.00
75% (less carloads)	130.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads)	31.00
14% to 16% (less carloads)	36.00

Silvery Iron

	F.o.b. Jackson, Ohio, Furnace
Per Gross Ton	
6%	\$22.25
7%	22.25
8%	24.25
9%	25.25
10%	26.25
11%	27.75
Per Gross Ton	
12%	\$29.25
13%	30.75
14%	32.25
15%	33.75
16%	35.25
17%	36.75

Ferrovanadium, del., per lb. contained Va.	\$2.60 to 2.80
Ferrocobalt, 15 to 18% per net ton, f.o.b. furnace in carloads	160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with \$2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	\$36.00
Ton lots or less, per ton	41.00
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	35.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	35 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.5% iron	\$1.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	1.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	8c.
Iron, low phos., Swedish, average 62 1/2% iron	8.50c.
Iron, basic or foundry, Swedish, average, 65% iron	8c.
Iron, basic or foundry, Russian, aver. 65% iron (nom.)	8c.
Manganese, Caucasian, washed 52% 48%	22c.
Manganese, African, Indian, 44-48%	20c.
Manganese, African, Indian, 49-51%	21c.
Manganese, Brazilian, 46 to 48%	17c.

	Per Net Ton Unit
Tungsten, Chinese wolframite, duty paid	\$12.00
Tungsten, domestic scheelite	\$11.00 to \$12.00
Chrome, 45%, Cr2O3, crude, c.i.f. Atlantic seaboard	16.00
Chrome, 48%, Cr2O3, c.i.f. Atlantic seaboard	18.00

*Quotations nominal in absence of sales.

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines	\$15.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	16.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	18.50
Domestic, No. 1 ground bulk, 85 to 98% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	30.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$12.50 to \$13.00
No. 2 heavy melting steel	11.00 to 11.50
No. 2 railroad wrought	12.50 to 13.00
Scrap rails	12.50 to 13.00
Rails 3 ft. and under	15.00 to 15.50
Sheet car crops, ordinary	13.00 to 13.50
Compressed sheet steel	12.50 to 13.00
Hand bundled sheet steel	11.50 to 12.00
Hy. steel axle turnings	11.00 to 11.50
Machine shop turnings	9.75 to 10.25
Short shov. steel turnings	9.75 to 10.25
Short mixed borings and turnings	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Cast iron car wheels	12.00 to 12.50
Heavy breakable cast	11.00 to 11.50
No. 1 cast	11.50 to 12.00
Railr. knuckles and couplers	14.00 to 14.50
Rail. coil and leaf springs	14.00 to 14.50
Roller steel wheels	14.00 to 14.50
Low phos. billet crops	15.50 to 16.00
Low phos. sheet bar crops	15.00 to 15.50
Low phos. plate scrap	14.50 to 15.00
Low phos. punchings	15.00 to 15.50
Steel car axles	15.00 to 15.50

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	\$9.50 to \$9.75
Shoveling steel	9.50 to 9.75

Hydraulic comp. sheets	\$7.75 to \$8.25
Drop forge flashings	7.25 to 7.75
No. 1 busheling	7.75 to 8.25
Roller car wheels	11.00 to 11.50
Railroad tires	10.75 to 11.25
Railroad leaf springs	11.00 to 11.50
Axle turnings	8.00 to 8.50
Steel couplers and knuckles	10.50 to 11.00
Coil springs	11.50 to 12.00
Axle turnings (elec. fur.)	8.00 to 8.50
Low phos. punchings	11.50 to 12.00
Low phos. plates, 12 in. and under	11.50 to 12.00
Cast iron borings	6.00 to 6.50
Short shoveling turnings	6.00 to 6.50
Machine shop turnings	5.50 to 6.00
Revolving rails	11.00 to 11.50
Steel rails, less than 3 ft. 11.50 to 12.00	
Steel rails, less than 2 ft. 12.00 to 12.50	
Angle bars, steel	10.50 to 11.00
Cast iron car wheels	10.00 to 10.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.00 to 8.50

	Per Net Ton
Iron car axles	\$12.50 to \$13.00
Steel car axles	11.00 to 11.50
No. 1 railroad wrought	8.25 to 8.75
No. 2 railroad wrought	8.25 to 8.75

No. 2 busheling	\$4.00 to \$4.50
Locomotive tires, smooth	9.00 to 9.50
Pipe and flues	4.75 to 5.25
No. 1 machinery cast	10.00 to 10.50
Clean automobile cast	10.00 to 10.50
No. 1 railroad cast	9.50 to 10.00
No. 1 agricultural cast	8.75 to 9.25
Stove plate	7.00 to 7.50
Grate bars	6.75 to 7.25
Brake shoes	8.75 to 9.25

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$10.50
No. 2 heavy melting steel	9.00
No. 1 railroad wrought	12.00
Bundled sheets	\$8.00 to 8.50
Hydraulic compressed, new	10.00 to 10.50
Hydraulic compressed, old	8.00 to 8.50
Machine shop turnings	7.50
Heavy axle turnings	9.50
Cast borings	7.00
Heavy breakable cast	10.50 to 11.00
Stove plate (shaking works)	9.00 to 9.50
No. 1 low phos. heavy	14.50
Couplers and knuckles	13.50
Roller steel wheels	13.50
No. 1 blast furnace	6.00 to 6.50
Spec. iron and steel pipe	9.00 to 9.50
Shafting	14.50 to 15.00
Steel axles (steel works)	13.50 to 14.00
No. 1 forge fire	10.50
Cast iron car wheels	12.00 to 12.50
No. 1 cast	11.00 to 12.00
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	12.00 to 12.50

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$10.25 to \$10.75
No. 2 heavy melting steel	9.75 to 10.25
Compressed sheet steel	9.00 to 9.50
Light bundled sheet stampings	8.50 to 9.00
Drop forge flashings	9.00 to 9.50
Machine shop turnings	7.00 to 7.50
Short shoveling turnings	7.50 to 8.00
No. 1 busheling	9.00 to 9.50
Steel axle turnings	7.50 to 8.00
Low phos. billet crops	12.50 to 13.00
Cast iron borings	7.00 to 7.50
Mixed borings and short turnings	7.00 to 7.50
No. 2 busheling	7.00 to 7.50
No. 1 cast	11.00 to 11.50
Railroad grate bars	5.50 to 7.00
Stove plate	7.50 to 8.00
Rails under 3 ft.	10.00 to 10.50
Rails for rolling	10.50 to 11.00
Railroad malleable	10.00 to 10.50
Cast iron car wheels	11.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:	
No. 1 heavy melting steel	\$10.00
No. 2 heavy melting scrap	9.00
Scrap rails	\$8.75 to 9.25
New hydraulic comp. sheets	9.00
Old hydraulic comp. sheets	8.50
Drop forge flashings	9.00
No. 1 busheling	9.00
Hvy. steel axle turnings	8.50 to 9.00
Machine shop turnings	6.50 to 7.00
Knuckles and couplers	11.50 to 12.00
Coil and leaf springs	11.50 to 12.00
Roller steel wheels	11.50 to 12.00
Low phos. billet crops	12.50 to 13.00
Short shov. steel turnings	7.00 to 7.50
Short mixed borings and turnings	6.50 to 7.00
Cast iron borings	6.50 to 7.00
No. 2 busheling	6.00 to 6.50
Steel car axles	11.00 to 12.00
Iron axles	11.00 to 12.00
No. 1 machinery cast	11.00 to 11.50
No. 1 cupola cast	11.00 to 11.50
Stove plate	8.75 to 9.25
Steel rails, 3 ft. and under	12.50 to 13.00
Cast iron car wheels	10.00 to 10.50
Industrial malleable	11.50 to 12.00
Railroad malleable	11.50 to 12.00
Chemical borings	9.00 to 10.00

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$10.00 to \$10.50
Scrap steel rails	9.50
Short shoveling turnings	5.50
Stove plate	7.00 to 7.50
Steel axles	11.00 to 11.50
No. 1 railroad wrought	7.00 to 7.50
Rails for rolling	9.50 to 10.00
No. 1 cast	9.50 to 10.00
Tramcar wheels	9.50 to 10.00
Cast iron borings, chem.	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	\$10.00 to \$10.50
No. 1 heavy melting	9.00 to 9.50
No. 2 heavy melting	8.00 to 8.50
No. 1 locomotive tires	8.00 to 8.50
Misc stand-sec. rails	10.00 to 10.50
Railroad springs	10.00 to 10.50
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	8.75 to 9.25
No. 1 busheling	6.50 to 7.00
Cast iron borings and shoveling turnings	4.75 to 5.25
Rails for rolling	10.50 to 11.00
Machins shon turnings	4.50 to 5.00
Heavy turnings	5.50 to 6.00
Steel car axles	11.50 to 12.00
Wrot. iron bars and trans.	9.50 to 10.00
No. 1 railroad wrought	7.00 to 7.50
Steel rails less than 3 ft.	11.50 to 12.00
Steel angle bars	10.00 to 10.50
Cast iron car wheels	9.00 to 9.50
No. 1 machinery cast	9.00 to 9.50
Railroad malleable	9.50 to 10.00
No. 1 railroad cast	9.00 to 9.50
Stove plate	7.00 to 7.50
Relay rails, 60 lb. and under	16.00 to 16.50

Relay, rails, 60 lb. and over	\$20.00 to \$21.00
Agricult. malleable	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$7.00 to \$7.50
Scrap T rails	6.75 to 7.25
Machine shop turnings	4.00 to 4.25
Cast iron borings	4.00 to 4.25
Bundled skeleton, long	5.50 to 6.00
Forge flashings	4.75 to 5.00
Blast furnace scrap	4.75 to 5.00
Shafting	9.00 to 9.50
Wrought pipe	3.50 to 4.00
Rails for rolling	6.00 to 6.50
Cast iron borings, chemical	11.00 to 11.50
Per gross ton delivered consumers' yards:	
Textile cast	\$10.00 to \$10.25
No. 1 machinery cast	10.00 to 10.25
Stove plate	6.25 to 6.50
Railroad malleable	11.00 to 12.00

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$9.00
No. 2 heavy melting steel	7.00
Unprepared yard iron and steel	\$3.50 to 4.00
No. 1 heavy breakable cast	6.50 to 6.75
Machine shop turnings	3.50
Short shoveling turnings	2.50
Cast borings	4.50 to 4.75
No. 1 blast furnace	3.50 to 4.00
Steel car axles	10.00 to 10.50

Spec. iron and steel pipe	\$4.50 to \$5.00
Forge fire	5.50 to 6.00
No. 1 railroad wrought	7.50 to 8.00
No. 1 yard wrought, long	8.50 to 9.00
Rails for rolling	8.50 to 9.00
No. 1 cast	7.00 to 7.50
No. 2 cast	6.00 to 6.50
Stove plate	6.00 to 6.50
Cast borings (chemical)	12.00 to 12.50
Per gross ton, delivered local foundries:	
No. 1 machinery cast	\$10.00
No. 1 hvy. cast (cupola size)	9.00
No. 2 cast	8.00

CINCINNATI

Dealers' buying prices per gross ton:	
Heavy melting steel	\$9.00 to \$9.50
Scrap rails for melting	9.25 to 9.75
Loose sheet clippings	5.00 to 5.50
Bundled sheets	6.00 to 6.50
Cast iron borings	6.40 to 6.50
Machine shop turnings	5.50 to 6.00
No. 1 busheling	7.00 to 7.50
No. 2 busheling	6.50 to 7.00
Rails for rolling	3.50 to 4.00
No. 1 locomotive tires	8.50 to 9.00
Short rails	11.25 to 11.75
Cast iron car wheels	8.50 to 9.00
No. 1 machinery cast	9.50 to 10.00
No. 1 railroad cast	9.00 to 9.50
Burnt cast	7.00 to 7.50
Stove plate	7.00 to 7.50
Agricultural malleable	8.75 to 9.25
Railroad malleable	9.25 to 9.75

DETROIT

Dealers' buying prices per gross ton:	
Heavy melting steel	\$7.75 to \$8.25
Borings and short turnings	6.50 to 6.80
Long turnings	5.50 to 6.00
No. 1 machinery cast	7.75 to 8.25
Automotive cast	9.50 to 10.00
Hydraulic comp. sheets	7.75 to 8.25
Stove plate	5.75 to 6.25
New factory busheling	7.00 to 7.50
Old No. 2 busheling	5.00 to 5.50
Sheet clippings	5.25 to 5.75
Flashings	6.25 to 6.75
Low phos. plate scrap	8.50 to 9.00

CANADA

Dealers' buying prices per gross ton:	
Toronto Montreal	
Heavy melting steel	\$5.50 \$5.50
Rails, scrap	6.00 4.50
Machine shop turnings	2.50 2.50
Boiler plate	4.50 4.50
Heavy axle turnings	2.50 2.50
Cast borings	3.00 3.00
Steel borings	2.00 2.00
Wrought pipe	2.50 2.50
Steel axles	4.50 4.50
Axles, wrought iron	4.50 4.50
No. 1 machinery cast	7.75 6.50
Stove plate	4.50 4.50
Standard car wheels	7.25 7.00
Malleable	6.75 7.00

Warehouse Prices for Steel Products

PITTSBURGH

Base per lb.	
Plates	2.85c
Structural shapes	2.85c
Soft steel bars and small shapes	2.60c
Reinforcing steel bars	2.60c
Cold-finished and screw stock	3.20c
Rounds and hexagons	3.20c
Squares and flats	3.20c
Hoops and bands, under 1/4 in.	2.95c
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.15c
Galv. sheets (No. 24), 25 or more bundles	3.50c
Hot-rolled sheets (No. 10)	2.50c
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$3.32
Spikes, large	2.40c
Small	2.45c
Boat	2.90c
Track bolts, all sizes, per 100 count	70 per cent off list.
Machine bolts, 100 count	70 per cent off list.
Carriage bolts, 100 count	70 per cent off list.
Nuts, all styles, 100 count	70 per cent off list.
Large rivets, base per 100 lb.	\$3.25
Wire, black, soft ann'd, base per 100 lb.	2.90
Wire, galv., base per 100 lb.	3.35
Common wire nails, per keg	2.45
Cement coated nails, per keg	2.45
On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.	

CHICAGO

Base per lb.	
Plates and structural shapes	3.00c
Soft steel bars	2.75c
Cold-fn. steel bars and shafting	3.25c
Rounds and hexagons	3.25c
Flats and squares	3.25c
Bands, 3/16 in. (in Nos. 10 and 12 gages)	2.95c
Hoops (No. 14 gage and lighter)	3.50c
Hot-rolled annealed sheets (No. 24)	3.45c
Galv. sheets (No. 24)	4.10c
Hot-rolled sheets (No. 10)	2.85c
Hot-rolled sheets (No. 10) and lighter	3.45c
Track bolts	4.30c
Rivets, structural (keg lots)	3c
Rivets, boiler (keg lots)	3c
Per Cent Off List	
Machine bolts	65
Carriage bolts	65
Coach and lag screws	65
Hot-pressed nuts, sq., tap, or blank	65
Hot-pressed nuts, hex., tap, or blank	65
Hex. head cap screws	80 and 10
Cup point set screws	75
Flat head bright wood screws	50 and 10
Spring cotters	60 and 10
Stove bolts	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	\$5.50 off list
No. 8 black ann'd wire per 100 lb.	\$3.45
Com. wire nails, base per keg	2.55
Cement c'd nails, base per keg	2.55

NEW YORK

Base per lb.	
Plates and struc. shapes	3.10c
Soft steel bars, small shapes	3.10c
Iron bars, steel	3.24c
Iron bars, steel	6.00c to 6.50c
Cold-fn. shafting and screw stock	3.79c
Rounds and hexagons	4.29c
Flats and squares	4.29c
Cold-roll. strip, soft and quarter hard	4.55c
Hoops	3.30c
Rands	3.30c
Hot-rolled sheets (No. 10)	3.00c
Hot-rolled ann'd sheets (No. 24)	3.65c
Galvanized sheets (No. 24)	4.00c
Long term sheets (No. 24)	4.50c
Standard tool steel	12.00c
Wire, black annealed (No. 10)	3.60c
Wire, galv. annealed (No. 10)	4.05c
Tire steel 1/4 x 1/4 in. and larger	3.40c
Smooth finish, 1 to 2 1/4 x 1/4 in. and larger	3.75c

Open hearth spring steel, bases	3.75c to 10.00c
Common wire nails, base, per keg	\$2.90
Machine bolt, cut thread: Off List	
1/4 x 6 in. and smaller	65
1 x 30 in. and smaller	65
Carriage bolts, cut thread	65
1/4 x 8 in. and smaller	65
1/2 x 20 in. and smaller	65
Boiler tubes: Per 100 Ft.	
Iron welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per lb.	
Plates and struc. shapes	3.25c
Bars, soft steel or iron	3.00c
Cold-fn. rounds, shafting, screw stock	3.61c
Hot-rolled annealed sheets (No. 24)	3.60c
Galv. sheets (No. 24)	4.25c
Hot-rolled sheets (No. 10)	3.10c
Black corrug. sheets (No. 24)	3.65c
Galv. corrug. sheets	4.30c
Structural rivets	3.25c
Boiler rivets	3.25c
Tank rivets, 7/16 in. and smaller	
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plug bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts	65
1000 lb. or over	65
200 to 999 lb.	65
100 lb.	65
Less than 100 lb.	50

PHILADELPHIA

Base per lb.	
*Plates, 1/4 in. and heavier	2.60c
*Structural shapes	2.60c
*Soft steel bars, small shapes, iron bars (except bands)	2.60c
Reinforc. steel bars, sq., twisted and deform.	2.90c
Cold-finished steel bars	3.60c
*Steel hoops	3.15c
*Steel bands, No. 12 to 3/16 in. incl.	2.90c
Spring steel	5.00c
Hot-rolled annealed sheets (No. 24)	3.30c
Galvanized sheets (No. 24)	3.75c
*Hot-rolled annealed sheets (No. 10)	2.75c
Diam. pat. floor plates, 1/4 in.	4.35c
Swedish iron bars	6.00c

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.
*Base prices subject to deductions on orders aggregating 4000 lb. or over.
†For 50 bundles or over.

CLEVELAND

Base per lb.	
Plates and struc. shapes	2.95c
Soft steel bars	2.75c
Reinforc. steel bars	1.75c to 2.35c
Cold-fn. steel bars:	
Rounds, squares, hexagons	3.25c
Flats	3.40c
Flat rolled steel under 1/4 in.	3.60c
Cold-finished strip	5.55c
Hot-rolled sheets (No. 24)	3.00c
Galvanized sheets (No. 24)	3.85c
Hot-rolled sheets (No. 10)	2.75c
Black ann'd wire, per 100 lb.	\$2.55
No. 9 galv. wire, per 100 lb.	2.90
Com. wire nails, base per keg	2.35

*Net base, including boxing and cutting to length.

CINCINNATI

Base per lb.	
Plates and struc. shapes	3.25c
Bars, soft steel or iron	3.00c
New billet reinforce. bars	3.00c
Rail steel reinforce. bars	3.00c
Hoops	3.75c
Rands	3.20c
Cold-finished bars	3.67c

Hot-rolled annealed sheets (No. 24)	3.60c
Galv. sheets (No. 24)	4.15c
Hot-rolled sheets (No. 10)	3.00c
Structural rivets	4.00c
Small rivets	.60 per cent off list
No. 9 ann'd wire, per 100 lb.	\$3.40
Com. wire nails, base per keg (10 to 49 kegs)	2.60
Larger quantities	2.50
Cement c'd nails, base 100-lb. keg	2.10
Chain, 1-in., per 100 lb.	7.10
	Net per 100 lb.
Seamless steel boiler tubes, 2-in.	\$18.10
4-in.	37.00
Hot-welded steel boiler tubes, 2-in.	24.00
4-in.	43.00

An Electric Power Famine Approaches

(Concluded from Page 14)

greatly improved Diesel electric equipment that has been made available very recently? Under certain conditions the private plant has proved to be very economical. Do you know whether it would be so for you?

These four avenues of approach to the problem of securing most advantageously more electric power are not new or untried. Thousands of industrial plant operators have traveled along these paths when the only incentive was the cutting of production costs. This incentive is still present, but back of it today is the even more urgent spectre of an electrical power famine. It may well be that these avenues will provide the only means of dodging that bugaboo.

It is with this thought in mind that two further articles in this series will be presented. The first will deal with ways and means of correcting high demand, and low power factor . . . both of which are susceptible to common sense electrical engineering treatment. The second will weigh the respective advantages of the central station vs. the private power plant, and suggest means of applying an analysis to your own conditions. (The group drive transmission problem is already being covered in detail in the articles on transmission drives by William Staniar, now appearing in THE IRON AGE.)

British Iron Output Off—Steel Higher

AUGUST production of pig iron in Great Britain amounted to 362,700 tons as compared with 343,900 tons in July, according to the National Federation of Iron and Steel Manufacturers. Four Scotland furnaces resumed operation and raised the total active furnaces to 73, as of Aug. 31. August output included 74,100 tons of foundry, 7800 tons of forge, 168,700 tons of basic, and 104,300 tons of hematite iron. Because of the August holidays production of steel ingots and castings for the month declined to 551,300 tons, as against 567,500 tons in July and 361,500 tons in August, 1932.

Questions Immediate Ascendency of Plastics

ANOTHER forecast regarding the ascendency of the plastics has been made. This time it is by H. V. Potter, chairman of the plastics group of the Society of Chemical Industry (Great Britain), who suggests that the age of metals is drawing to a close and that the age of plastics is opening.

His assertions moved *The Engineer*, of London, to make the following comment: "All that can be said at the moment is that the chemist has given to the world a new material which is suitable for some of the purposes for which steel and iron are now used. We have still to await the time when an engineer has the courage to design a bridge in one of the modern plastics, and the industry is in a position to supply the members to his specification."

It is admitted, that the industry has grown in a few years until it has now

a turnover of something like \$100,000,000 a year. Sheets of plastic 7 or 8 ft. wide are now obtainable, but save when very thin they cannot be bent and molded as steel and aluminum are.

"Dascoloy" Becomes "Krokoloy"

BECAUSE of the similarity of the name "Dascoloy" to the name of another trademarked alloy, the Detroit Alloy Steel Co. has decided to change the name from "Dascoloy" to "Krokoloy," and hereafter their leading chrome cobalt alloy tool steel cast to shape will be known by this latter name.



WYCKOFF DRAWN STEEL CO.

With a combined capacity of more than 25,000 tons of finished steels per month, the two modern plants of the Wyckoff Drawn Steel Company are backed by a coast to coast organization of district representatives serving every large industrial center throughout the country. Their services as well as those of our plant mechanical and metallurgical departments are always available in solving any difficult or perplexing problem. Let us cooperate with you.

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PLANT EXPANSION AND EQUIPMENT BUYING

◀ NEW ENGLAND ▶

Van Nostrand Brewing Co., 60 Alford Street, Charlestown, Boston, plans modernization of present plant and erection of new units to increase capacity to 200,000 bbl. a year. Company is arranging stock issue of about \$530,000, considerable part of proceeds to be used for work. William T. Van Nostrand is vice-president and general manager.

State Department of Mental Diseases, State House, Boston, plans extensions and improvements in steam power plant at State institution at Grafton, Mass. Cost about \$100,000 with equipment. Charles T. Main, Inc., 201 Devonshire Street, Boston, is engineer.

Boston Sheet Metal & Sterilizer Co., Inc., Everett, Mass., has been organized by Earle L. Smith, 9 Bowman Street, Dorchester, Mass., and associates, to manufacture sheet metal products.

United States Coast Guard Headquarters, Washington, plans removal of present air base at Gloucester, Mass., to Salem, Mass., where new hangars with repair and reconditioning shop, machine shop, radio station and other structures will be built. Cost over \$250,000 with equipment. Appropriation has been granted.

E. B. Badger & Sons Co., 75 Pitts Street, Boston, manufacturer of chemical plant equipment, copper-smithing products, etc., has leased one of buildings at plant of Worthington Pump & Machinery Corp., East Cambridge, Mass., totaling about 20,000 sq. ft. floor space, for new shop unit.

Bureau of Supplies and Accounts, Navy Department, Washington, has secured appropriations of \$85,000 and \$69,000 for tools and machinery for Portsmouth, N. H., and Boston Navy yards, respectively. Early call for bids is planned.

◀ BUFFALO DISTRICT ▶

City Council, Bath, N. Y., plans installation of pumping machinery and other equipment, pipe lines, etc., for extensions and improvements in municipal water system. Financing for \$200,000 is being arranged.

Processed Metals Corp., Lockport, N. Y., has been organized under direction of David E. Jeffrey, Benley Building, to manufacture special metal products.

◀ NORTH ATLANTIC ▶

F. & M. Schaefer Brewing Co., 2 South Ninth Street, Brooklyn, has let general contract to Cauldwell-Wingate Co., 101 Park Avenue, New York, for four-story and basement addition, 90 x 120 ft., for bottling works. Cost about \$100,000 with equipment. Walde-mar Mortensen, 103 Park Avenue, New York, is engineer.

L. Mundet & Son, 65 South Eleventh Street, Brooklyn, operating Mundet Cork Corp., have plans for new two-story shop and repair building, 40 x 85 ft. Cost about \$25,000 with equipment. Benjamin Schlanger, 70 East Forty-fifth Street, New York, is architect.

Ever Ready Machinists, Inc., New York, has been organized by Max Baron and Irving Steiner, 10 Peck Slip, and associates, to operate a general machine works, manufacture tools and equipment.

Steel Metal Specialty Co., Long Island City, recently organized to manufacture steel automobile signs and kindred products, has leased one-story building at 37-20 Twenty-second Street, for plant.

Conrad Kasik, 501 West Fifty-fourth Street, New York, has leased space in building at 780-82 Twelfth Avenue, for new machine and repair works.

Flanagan-Nay Brewery, West Twenty-fifth Street, New York, has plans for extensions and improvements, including new equipment. Cost over \$85,000 with machinery.

J. Chr. G. Hupfel Brewing Corp., 229 East Thirty-eighth Street, New York, recently chartered with capital of \$2,000,000 to take over Hupfel brewery, 224-32 East Thirty-ninth Street, has plans for new two-story bottling plant, 95 x 110 ft. Cost about \$75,000 with

equipment. Bruno W. Berger & Son, Bible House, are architects.

Superheater Co., 60 East Forty-second Street, New York, manufacturer of superheaters, parts and kindred power equipment, has secured a substantial interest in Air Preheater Corp., Wellsville, N. Y., and will be active in management. Last noted company will continue under present name, with plant at same location. H. S. Colby, heretofore president, will continue as vice-president of Air Preheater organization.

Phil Dietz Coal Co., 61-20 Seventy-first Avenue, Ridgewood, Brooklyn, plans bulk oil storage and distributing plant, with steel tanks and other mechanical equipment, for fuel oil supply and distribution, at Long Island City. Cost about \$30,000 with equipment.

Garry Bowden, 61-19 Metropolitan Avenue, Maspeth, L. I., has filed plans for new one-story building, 50 x 104 ft., part of unit to be used as a forge and machine shop. Charles J. Stidolph, 87-01 Fifty-first Avenue, Newtown, L. I., is architect.

Richards Chemical Works, 190 Warren Street, Jersey City, N. J., manufacturer of industrial and textile chemicals, has let general contract to James Billington, Inc., 198 Fairmount Avenue, for four-story addition, 25 x 100 ft., and two-story top addition to present factory on Essex Street, 100 x 125 ft. Cost about \$75,000 with equipment.

Department of Institutions and Agencies, State Office Building, Trenton, N. J., asks bids until Oct. 17 for new water treating, filtering, aerating and other mechanical equipment for water system for institution at Marlboro, N. J.

City Commission, Bordentown, N. J., has secured estimates of cost totaling \$135,000 for new municipal electric light and power plant. Financing is now being considered. Charles B. Rodgers is chairman of committee in charge.

Norton Metalcraft, Inc., Irvington, N. J., has been organized by Oscar Hilmer and Irving Greenfield, 1001 Springfield Avenue, to manufacture art metal and other metal products.

Hillside Plastics Co., Hillside, Newark, N. J., recently organized to manufacture molded products, has purchased factory at 185 Chestnut Avenue, Hillside, 13,000 sq. ft. floor space, for new plant.

General American Tank Storage & Terminal Co., 122 East Forty-second Street, New York, has applied for permission to build new battery of steel storage tanks, pumping plant and other facilities at plant at Carteret, N. J., formerly property of American Mineral Spirits Corp. Initial installation will include three tanks of 80,000 bbl. capacity and one tank, 20,000 bbl.

Congoleum-Nairn, Inc., Marcus Hook, Pa., manufacturer of hard surface floor coverings, has plans for new one-story machine shop and laboratory. Cost about \$25,000 with equipment. W. W. Lindsay & Co., Harrison Building, Philadelphia, are engineers.

Continental Distilling Corp., Snyder Avenue and Swanson Street, Philadelphia, has acquired adjoining property, including factory unit, 42 x 381 ft., for plant expansion in connection with development program now under way to cost about \$800,000 with equipment. Company is associated with Publicker Commercial Alcohol Co., 260 South Broad Street.

Edward G. Budd Mfg. Co., Twenty-fifth Street and Hunting Park Avenue, Philadelphia, manufacturer of steel automobile bodies, has begun tool-making program for 1934 car models at Philadelphia and Detroit plants. Work will cost over \$1,000,000 with raw material and equipment, and is scheduled for completion in December.

New Jersey-Delaware Brewing Co., Wilmington, Del., recently organized, has acquired plant of Joseph Stoeckle Brewing Co., Fifth and Adams Streets, for price of \$150,000, for new plant. Extensions and improvements will be made, to include brew-house, bottling and other equipment. Cost about \$100,000 with machinery.

Excello Machine & Welding Works, Inc., 260 Tenth Avenue, Paterson, N. J., has completed an extension to its plant and will install additional equipment.

◀ WESTERN PENNA. ▶

Metals & Alloys, Inc., Grove City, Pa., recently organized by Dr. E. J. Fithian, Grove City, has leased two buildings for reclaiming non-ferrous metals and metal scrap. Employment will be given to more than 100 men. Work is under way on two large furnaces, with accessory units.

McDaniel Refractory Porcelain Co., Beaver Falls, Pa., manufacturer of pyrometer tubes and kindred precision products, has revised plans for new two-story and basement plant, 40 x 130 ft., to replace unit recently destroyed by fire. Bids recently received on general contract have been rejected. Cost about \$30,000 with equipment. J. E. Martsolf, 512 Third Avenue, is architect.

West Virginia Brewing Co., Huntington, W. Va., recently referred to in these columns, will be operated as Fesenmeier Brewing Co., headed by M. I. Fesenmeier, president, Fesenmeier Packing Co. Present buildings will be converted for brewing plant. Cost about \$150,000 with machinery. Konrad Kell, 1215 Windsor Drive, Dayton, Ohio, is engineer.

Masontown Brewing Co., Masontown, Pa., has approved plans for extensions and improvements, to include new equipment. Cost about \$40,000 with machinery.

United States Engineer Office, Pittsburgh, has secured appropriation of \$2,500,000 for new roller crest dam in Ohio River, Montgomery Island, near Beaver, Pa., recently referred to in these columns. Project will include power house, traveling cranes and other machinery, in addition to roller gate structures. Fund of \$900,000 also has been authorized for construction of Dam No. 3, Allegheny River, near Oakmont, Pa., including power house and machinery. Bids will be asked soon.

Hausman & Wimmer Co., Midland, Pa., property will be sold at public auction Oct. 10, including iron and metal-working equipment, scrap yard machinery, etc. Commonwealth Trust Co., Pittsburgh, is receiver.

◀ OHIO AND INDIANA ▶

Sun Oil Co., 1608 Walnut Street, Philadelphia, has approved plans for addition to bulk oil storage and distributing plant at Cleveland, including steel tanks and auxiliary equipment. Cost about \$50,000.

City Council, Shelby, Ohio, is arranging financing in amount of \$150,000 for extensions and improvements in municipal electric light and power plant, to include additional equipment.

Goodrich-Silvertown, Inc., Akron, Ohio, subsidiary of B. F. Goodrich Co., has let general contract to Austin Co., Cleveland, for new one and one-half story factory branch, service and distributing building at Cincinnati. Cost about \$45,000 with equipment.

Common Council, Circleville, Ohio, has authorized surveys and plans for a municipal electric light and power station, and water-works. Cost over \$100,000 with equipment. Fosdick & Hilmer, Union Trust Building, Cincinnati, are consulting engineers.

City Council, East Palestine, Ohio, plans installation of water-softening plant for municipal water system, with pumping machinery and auxiliary equipment. Cost about \$50,000.

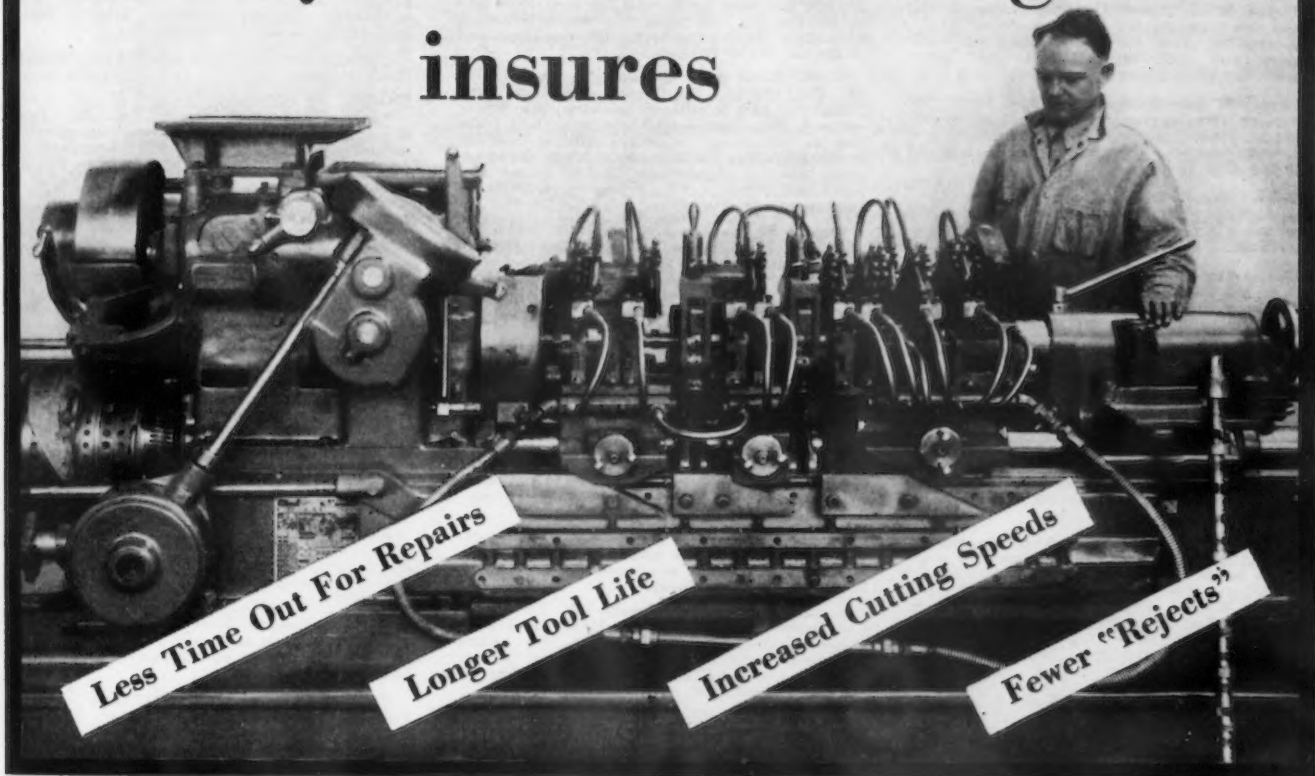
Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until Oct. 17 for 1800 aircraft storage batteries (Circular 80), 45 pneumatic rafts (Circular 81).

Firestone Steel Products Co., Akron, Ohio, subsidiary of Firestone Tire & Rubber Co., is arranging for heavy commercial production of a recently perfected beer barrel, made of double steel walls, outer shell formed of heavy-gauge corrugated steel and inner wall of smooth stainless steel.

Common Council, Tipton, Ohio, plans new municipal electric light and power plant. Cost about \$150,000 with equipment. Financing is being arranged. Bevineton & Williams, Inc., Knights of Pythias Building, Indianapolis, is consulting engineer.

Nurane Corp., Shelbyville, Ind., has been organized by Thomas P. Nickell and David

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H. Whitcomb, Shelbyville, to manufacture mechanical products, parts, etc.

Ingersoll Steel & Disc Co., Newcastle, Ind., manufacturer of steel disks, sheets, shovels, etc., has let general contract to A. R. Hunnicut, 1310 Vine Street, for one-story addition, 60 x 160 ft. Cost over \$40,000 with equipment. Company is a subsidiary of Borg-Warner Corp., Chicago.

Banner Die Tool & Stamping Co., Columbus, Ohio, has moved to larger quarters at 1288 Holly Avenue, that city, and has purchased additional equipment. J. E. O'Brien is general manager.

◀ SOUTH ATLANTIC ▶

Broad River Power Co., Columbia, S. C., plans new transmission line to Eastover, S. C., and vicinity, about 19 miles, with power substation and switching station. Cost over \$75,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, has secured appropriation of \$76,000 for new tools and machinery for navy yard at Charleston, S. C. Early call for bids is planned.

Town Council, Mount Pleasant, S. C., plans installation of pumping machinery and other equipment, pipe lines, etc., for new municipal waterworks. Cost about \$85,000.

United States Engineer Headquarters, Washington, has secured appropriation of \$1,520,000 for new lock and dam on Cape Fear River, near Wilmington, N. C., including roller gates, operating mechanism, power plant, pumping station and other units. Early call for bids is planned by district engineer.

Common Council, Clinton, S. C., is considering new municipal electric light and power plant to cost about \$100,000 with equipment. Also extensions and improvements in municipal water system, including pumping machinery and auxiliary equipment, pipe lines, etc., to cost \$80,000. Financing will soon be arranged.

United States Coast Guard Headquarters, Washington, has secured appropriation for four new air bases, to be located at St. Petersburg, Fla., Biloxi, Miss., Galveston, Tex., and Port Angeles, Wash., each to consist of hangars with repair and reconditioning facilities, radio station, machine shop and barracks. Each base will cost about \$290,000 with equipment.

Tampa Shipbuilding & Engineering Co., Tampa, Fla., plans new shipbuilding and repair plant, including dry docks of 10,000 tons capacity, machine shops, template shop, electrical and woodworking shops and other units. Company has waterfront site and has secured Federal loan of \$750,000 for project, including equipment.

◀ WASHINGTON DISTRICT ▶

Wight Distilling Co., Gillet Building, Baltimore, has approved plans for new plant on Gunpowder River, near Philadelphia Road, and improvements in existing buildings. Cost over \$85,000 with equipment. Engineering-Contracting Corp., 504½ St. Paul Street, is general contractor.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Nov. 8 for extensions in pumping plant, including electric-operated pumping machinery and auxiliary equipment, piping, etc. (Specifications 7136); until Nov. 15, addition to foundry, including electric bridge crane, pneumatic hoists, electric system, etc. (Specifications 7094), four traveling cranes (Specifications 7419), at Pearl Harbor, T. H., Navy Yard. Appropriation of \$75,000 has been authorized for new tools and machinery for this yard, for which bids will be asked soon by Bureau of Supplies and Accounts, Navy Department.

G. E. Stone and Alexander S. Porter, 512 St. Paul Street, Baltimore, architects, have plans for new distillery for company whose name is temporarily withheld, including eight one to four-story buildings for fermenting works, bottling department, dryer building, grain storage department, power house and other departments. Cost over \$125,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 10 for two motor-driven sewage pumps (Schedule 766) for Philadelphia or New York Navy yard; carbon and high speed twist drills (Schedule 747), flexible bronze steam hose (Schedule 765), 50 portable electric drills (Schedule 748) for Mare Island yard.

◀ SOUTH CENTRAL ▶

Kingham Trailer Co., Gaubert and Floyd Streets, Louisville, manufacturer of motor trailers, parts, etc., will take bids soon for one-story, L-shaped plant, 250 x 410 ft. Cost about \$45,000 with equipment. C. M. Grimes, 633 South Fifth Street, is architect.

George T. Stagg Distillery Co., Frankfort, Ky., plans extensions and improvements, including additional equipment. Cost over \$300,000 with machinery.

Common Council, Tompkinsville, Ky., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for extensions and improvements in municipal waterworks. Cost about \$40,000. Financing is being arranged.

Hermitage Distillery, Frankfort, Ky., has been acquired by Allied Brewing & Distilling Co., New York, recently organized. Extensions and improvements will be made, to include additional equipment. Cost over \$90,000 with machinery.

Port Commission, Greenville, Miss., Theodore Brent, Board of Trade Annex, New Orleans, agent in charge, asks bids at last-noted office until Oct. 16 for pneumatic grain-handling equipment, also for constructing and equipping a steel wharf boat.

Heidelberg Brewing Co., 600 Madison Avenue, Covington, Ky., has let general contract to George Lubrecht Co., Pleasant Ridge, Fort Mitchell, Ky., for two, three and four-story additions, 100 x 210 ft., including one-story boiler plant. Cost about \$300,000 with equipment.

◀ MIDDLE WEST ▶

United States Printing & Lithographing Co., St. Charles, Ill., has plans for new one-story plant, 97 x 380 ft. Cost over \$80,000 with equipment. Robert Salisbury, Liberty Building, Wheaton, Ill., is architect.

United States Engineer Office, First District, Chicago, asks bids until Oct. 9 for one portable air compressor (Circular 39).

Farmers National Grain Co., St. Paul, Minn., plans rebuilding part of grain elevator, including conveyor house and mechanism, recently damaged by fire. Loss over \$80,000 with equipment.

Municipal Water and Light Department, Duluth, Minn., plans installation of pumping machinery, from 100 to 600-gal. per min. capacity, and auxiliary equipment for extensions and improvements in municipal water system. Also 50,000-75,000-gal. elevated steel tank and tower. T. M. Basterash, 414 West First Street, is city engineer.

Kelley Brothers Co., 923 Nicollet Avenue, Minneapolis, P. J. Kelley, president, plans extensions and improvements in three-story and basement brewery, 150 x 150 ft., to include brew-house, bottling, mechanical-cooling and other machinery, and steam power plant equipment. Cost over \$225,000.

Finders Mfg. Co., 224 West Superior Street, Chicago, has been organized by R. E. Kaplan and associates, to manufacture metal products.

Elgin Piston Pin Co., 101 Hamilton Avenue, Elgin, Ill., has let general contract to Alexander McTavish, 650 Park Street, for two-story addition. Cost about \$21,000 with equipment.

Common Council, Harvey, N. D., plans new municipal electric light and power plant. Cost about \$75,000 with equipment. Financing is being arranged.

Department of Water, City Hall, Lincoln, Neb., Paul W. Doerr, commissioner, plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for extensions and improvements in municipal waterworks. Financing for \$204,000 is being arranged. D. L. Erickson is city engineer.

Board of Water, Electric, Gas and Power Commissioners, Municipal Power Building, Austin, Minn., plans new equipment storage and distributing plant, garage and repair unit at municipal power station. Cost about \$43,000 with equipment. R. D. Thomas, 1200 Second Avenue South, Minneapolis, is consulting engineer.

Common Council, Villisca, Iowa, has plans for new municipal electric light and power plant. Cost about \$150,000. Financing is being arranged.

Common Council, Jamestown, S. D., has passed resolution favoring erection of new municipal electric light and power plant to cost about \$500,000 with equipment. Committee has been appointed to secure details, headed by Dr. G. T. McDonald and J. D. Gray. Financing will soon be arranged.

South Side Malleable Casting Co., 2700 South Nineteenth Street, Milwaukee, has placed general contract with Klug & Smith Co., engineer and contractor, 111 East Wisconsin Avenue, Milwaukee, for repairing fire damage of upward of \$65,000 in main shop last spring.

Old Port Brewing Co., Port Washington, Wis., has plans by Urban F. Peacock, architect, 719 North Thirty-second Street, Milwaukee, for improvements in and enlargement of plant, including new refrigerating unit. Cost about \$50,000.

City Council, Altoona, Wis., has plans by Druar & Milinowski, consulting engineers, 904 Globe Building, St. Paul, for new sewer and sewerage disposal plant to cost \$50,000. Application has been made for R. F. C. loan. George A. Thurston is city clerk.

Weber Brewing Co., Waukesha, Wis., has acquired Waukesha Dairy Co. plant and will invest \$100,000 in remodeling and installing new equipment, including 50 steel tanks, steel

Bargains Today Scrap Tomorrow

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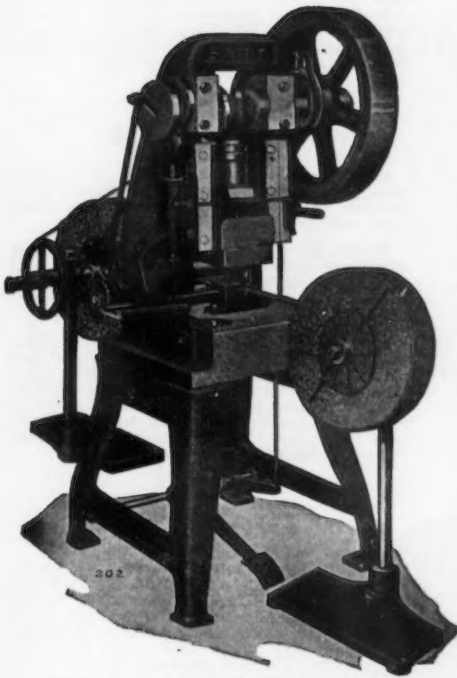
The cost of manufactured metal products is going up—there's no doubt of that! While this operation of raising costs originates from patriotic motives, yet an increased cost is a mighty poor sales argument to overcome resistance to a higher selling price. Consequently there will be competition among manufacturers to see which can raise costs the least without chiseling.

The manufacturers who continue to use old machinery and methods will bear the full brunt of the cost increases. The manufacturers, who use new and more efficient machines which combine operations, reduce setup time and in various ways effect economies, will find their increased costs less severe. Their reward will be more sales due to more favorable selling price.

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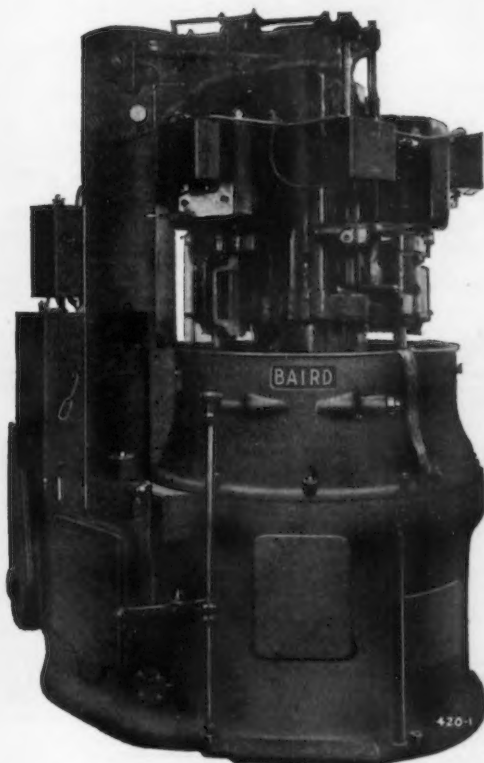
THE BAIRD MACHINE COMPANY
BRIDGEPORT, CONN.



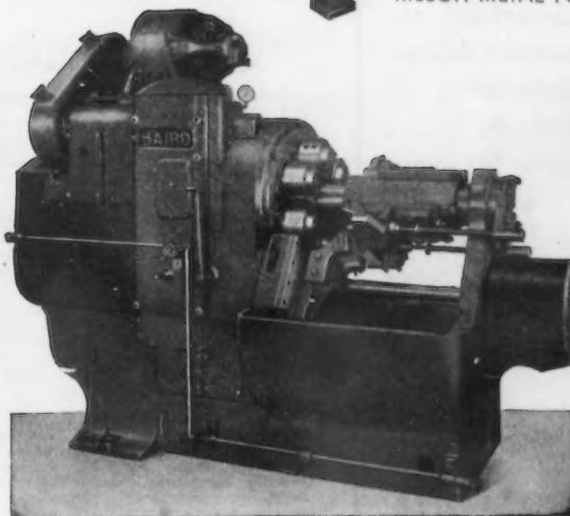
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BAIRD AUTOMATIC WIRE AND
RIBBON METAL FORMING MACHINES



BAIRD AUTOMATIC MULTIPLE SPINDLE
INTERNAL GRINDERS



BAIRD AUTOMATIC HORIZONTAL AND VERTICAL
MULTIPLE SPINDLE LATHES



malt bins, 125-bbl. brew kettle, steel stock tanks, etc. F. W. Andree, 2205 North Fifty-seventh Street, Milwaukee, is architect.

◀ MICHIGAN DISTRICT ▶

Cadillac Brewing Co., Shoemaker Avenue, Detroit, recently organized, has approved plans for new nine-story and basement plant, with two-story office building adjoining. Cost about \$400,000 with machinery. F. C. Sebulske is president and managing director. G. A. Mueller, 1346 Broadway, is architect.

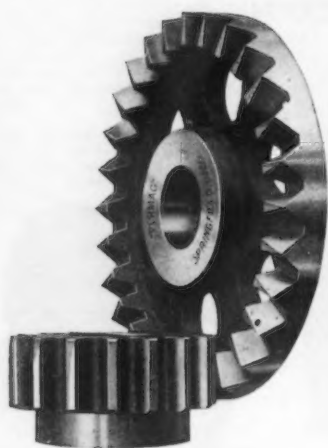
United States Coast Guard, Milwaukee, plans new station with mechanical equipment at Frankfort, Mich., and new boat house at station at St. Joseph, Mich. Cost about \$48,000 with equipment.

Wolverine Brewing Co., Pontiac, Mich., plans extensions and improvements, to include additional equipment. Cost over \$75,000 with equipment. Patterson Engineering Co., Inc., 8044 Wheeler Street, is engineer.

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SPRINGFIELD, MASS.

R. J. Tower Iron Works, Inc., Greenville, Mich., has been organized, capital \$50,000, by Francis E. Tower, Greenville, and associates, to manufacture metal castings, operate a general iron works and machine shop.

Village Council, Port Hope, Mich., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for extensions in municipal waterworks. Cost about \$25,000.

Chrysler Corp., Detroit, has approved plans for new administration building for its Chrysler and DeSoto automobile divisions. New unit will be 500 ft. long and will cost about \$350,000. It is scheduled for completion about middle of December, when company will convert present administrative and factory offices, totaling about four acres of floor space, for manufacturing, with additional equipment for parts production and assembling for two car models noted. Albert Kahn, New Center Building, is architect.

◀ SOUTHWEST ▶

Progress Brewing Co., 510 Braniff Building, Oklahoma City, Oklahoma City, Okla., F. E. Wanamaker, general manager, recently organized, will soon begin superstructure for eight-story and basement plant, including storage and distributing units, power house and machine shop. Cost about \$500,000 with equipment. MacDonald Engineering Co., 1 North LaSalle Street, Chicago, general contractor.

Falstaff Brewing Corp., 3684 Forest Park Boulevard, St. Louis, has engaged J. H. Grove, Boatmen's Bank Building, architect, to draw plans for new storage and distributing plant. Bids will be asked on general contract this month. Cost about \$175,000 with equipment, including new conveyor system over Clark Avenue to connect with existing plant unit.

Common Council, Concordia, Mo., has called special election to approve bonds for \$70,000 for new municipal electric light and power plant. W. B. Rollins & Co., Railway Exchange Building, Kansas City, Mo., are consulting engineers.

Board of Trustees, Arkansas Polytechnic College, Russellville, Ark., plans new power plant for central steam heating and new multi-story engineering building, in connection with building program at institution to cost over \$300,000. J. W. Hull is president. Program has been approved by State Public Works Commission.

Common Council, Pecos, Tex., is arranging financing for \$250,000, fund to be used for new municipal electric light and power plant and waterworks, latter to include electric-operated pumping machinery and auxiliary equipment, pipe lines, etc.

Pan-American Airways, Inc., Brownsville, Tex., plans new hangar, with repair and reconditioning facilities. R. D. Sundell, division engineer, in charge. Main offices are at 135 East Forty-second Street, New York.

City Council, Waco, Tex., E. E. McAdams, city manager, plans installation of pumping machinery and accessories, pipe lines, etc., for extensions in municipal water system. Cost about \$140,000. Financing is being arranged.

◀ PACIFIC COAST ▶

General Brewing Corp., Bayshore Avenue and Third Street, San Francisco, has let general contract to Cahill Brothers, 206 Sansome Street, for new plant, with one-story power house and machine shop. Cost about \$700,000 with equipment. Fred H. Meyer, 525 Market Street, is architect.

City Council, Anaheim, Cal., plans municipal electric light and power distributing system. Cost \$53,000 with equipment. Financing is being arranged. J. E. Brown is consulting engineer.

Public Works Officer, Naval Station, San Diego, asks bids until Oct. 12 for addition to building No. 27 for equipment storage and distribution (Specification 7472); until Oct. 11, for extensions and improvements in water system (Specifications 7424).

John B. Cella, Lodi, Cal., has let general contract to L. Franceschi, 1900 Beach Street, San Francisco, for new winery, with main one-story unit, 100 x 420 ft., and several smaller structures. Installation will include fermenting machinery, 30-ton capacity refrigeration plant and other equipment. Cost about \$140,000 with machinery. H. C. Baumann, 251 Kearny Street, San Francisco, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, has secured appropriations of \$240,000 and \$271,000 for tools and

machinery for Mare Island and Puget Sound Navy yards, and plans early call for bids.

Pilsner Brewing Co., 554 First Avenue South, Seattle, has let general contract to Lorenz Brothers, Title and Trust Building, Portland, for new plant at Portland, including remodeling and modernization of existing building. Cost close to \$300,000 with machinery.

Kern County Union High School District, Bakersfield, Cal., plans manual training department in new high school on F Street. Cost about \$125,000. Charles H. Biggar, Habersfelde Building, is architect.

City Council, Roseville, Cal., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for new municipal water system. Cost about \$160,000. Financing is being arranged. Baer & Cunningham, Portland, are consulting engineers.

◀ CANADA ▶

Canadian Celanese Co., Ltd., Drummondville, Que., manufacturer of cellulose rayon products, plans expansion and improvements. Cost close to \$100,000 with equipment.

Eclipse Gold Mining Co., Ltd., Montreal, is arranging common stock issue to total about \$250,000, considerable portion of proceeds to be used for expansion at mining properties, including new equipment.

Shawinigan Water & Power Co., Montreal, has approved plans for expansion at hydroelectric generating plant at Rapide Blanc, Que., to increase capacity to about 100,000 hp. by next spring, to be followed by further extensions to develop 160,000 hp. by fall of 1934. Cost over \$700,000 with transmission lines. Julian C. Smith is managing director.

◀ FOREIGN ▶

Benguet Consolidated Mining Co., Manila, Philippine Islands, operating gold mining properties at Balatoc, is planning development of large chromium deposits in Province of Ambos Camarines, to include mining machinery and plant for commercial reduction. Cost about \$125,000 with equipment.

Norsk Hydro-Elektrisk Kvaestofaktieselskab, Heren, Norway, plans addition to local plant, given over to soda ash and kindred material production, for manufacture of ammonium sulphate, a product not previously made by company. Cost over 2,000,000 kroner (about \$468,000) with equipment.

Administrative Board of Capital, office of J. Benitez Castano, city manager, San Juan, Puerto Rico, asks bids until Oct. 24 for 14,775 water meters and quantity of meter boxes.

Compania Minera Los Amigos, S. A., Encarnacion, Jalisco State, Mexico, a subsidiary of Los Amigos, Inc., Mexico City, plans expansion at metallic tin properties, including additional equipment.

Administration Control of National Petroleum (Federal Agency), Mexico, D. F., plans new oil refinery at Atzacapotzalco, Mexico, to handle 2000 bbl. crude oil a day, to be secured from Tampico, Mexico, oil fields. Completion is scheduled by close of year. Cost over \$200,000 with equipment.

Director General, Ports and Lighthouse Administration, Alexandria, Egypt, asks bids until Oct. 25 for electric-operated winches, electric cable, switchgear, transformers and other electrical equipment.

United Fruit Co., Pier 3, North River, New York, is considering erection of a new dehydrating and powdering plant for food products at Kingston, Jamaica. Cost over \$125,000 with equipment.

Soviet Russian Government, Moscow, is planning erection of three nitrogen plants for commercial fertilizer production. The first will be located at Chirchiki, near Tashkent, and will have capacity of 150,000 tons of ammonia a year. Other two plants will be built in conjunction with metallurgical works at Magnitogorsk and Kuznetz, to utilize coke oven gas for hydrogen service under special process, now being developed by Nitrogen Research Institute, Moscow. Entire project will cost over \$2,500,000. Amtorg Trading Corp., 261 Fifth Avenue, is official buying agency.

United Screw & Bolt Corp. has moved its New York warehouse and office from 103 Lafayette Street, to Oatman Bldg., 71-73 Murray Street.



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25 BROADWAY, NEW YORK

UNITED METALS SELLING COMPANY

Gain in Iron and Steel Exports in August

Exports of Iron and Steel from the United States

(In Gross Tons)

	August		Eight Months Ended August	
	1933	1932	1933	1932
Pig iron	412	194	1,707	1,864
Ferromanganese	3	2	11	20
Scrap	70,145	12,578	473,051	152,164
<i>Pig iron, ferroalloys and scrap</i>	<i>70,560</i>	<i>12,774</i>	<i>474,769</i>	<i>154,148</i>
Ingots, blooms, billets, sheet bar	699	53	1,603	1,266
Skelp	1,184	2,201	9,414	16,794
Wire rods	1,268	469	8,532	9,802
<i>Semi-finished steel</i>	<i>3,151</i>	<i>2,723</i>	<i>19,549</i>	<i>27,862</i>
Steel bars	2,493	760	13,239	10,815
Alloy steel bars	135	82	874	1,240
Iron bars	47	25	347	500
Plates, iron and steel	961	839	4,744	8,223
Sheets, galvanized steel	3,091	944	21,017	16,725
Sheets, galvanized iron	78	62	623	959
Sheets, black steel	2,945	2,010	17,629	27,510
Sheets, black iron	354	73	1,331	1,963
Hoops, bands, strip steel	1,939	648	13,254	13,406
Tin plate;terne plate	7,333	2,445	37,682	24,451
Structural shapes, plain material	2,694	1,715	7,687	11,537
Structural material, fabricated	1,241	985	8,752	11,453
Tanks, steel	154	72	1,546	1,556
Steel rails	2,951	221	11,628	9,264
Rail fastenings, switches, frogs, etc.	1,180	177	2,873	2,980
Boiler tubes	353	470	2,468	2,411
Casing and oil-line pipe	1,441	277	18,243	12,487
Pipe, black and galvanized, welded steel ...	3,846	2,132	19,175	17,845
Pipe, black and galvanized, welded iron	108	116	935	2,805
Plain wire	3,320	318	9,457	6,194
Barbed wire and woven wire fencing	3,807	906	17,243	12,713
Wire cloth and screening	71	49	444	444
Wire rope	181	72	1,218	1,043
Wire nails	1,442	331	6,270	5,319
Other nails and tacks	451	183	2,570	2,411
Horseshoes	47	23	104	57
Bolts, nuts, rivets and washers, except track..	240	153	2,001	1,779
<i>Rolled and finished steel</i>	<i>42,803</i>	<i>16,092</i>	<i>223,354</i>	<i>208,090</i>
Cast iron pipe and fittings	1,081	217	6,401	5,891
Malleable iron screw fittings	229	105	1,371	1,149
Car wheels and axles	392	222	2,725	2,020
Iron castings	495	200	1,823	1,613
Steel castings	91	136	581	966
Forgings	171	198	1,896	2,736
<i>Castings and forgings</i>	<i>2,459</i>	<i>1,078</i>	<i>14,797</i>	<i>14,375</i>
All other	401	283	2,484	2,862
Total	119,374	32,950	734,953	407,237

Imports of Iron and Steel Products into the United States

(In Gross Tons)

	August		Eight Months Ended August	
	1933	1932	1933	1932
Pig iron	18,488	7,198	99,654	83,074
Sponge iron	100	...	372	101
Ferromanganese and Spiegeleisen*	4,889	1,134	31,588	15,969
Ferrochrome† .....	...	14	21	133
Ferrosilicon†	28	8	110	44
Other ferroalloys .....	...	...	102	672
Scrap	9,508	864	32,383	5,162
<i>Pig iron, ferroalloys and scrap</i>	<i>33,013</i>	<i>9,218</i>	<i>164,230</i>	<i>105,155</i>
Steel ingots, blooms, etc.	121	14	492	2,095
Wire rods	1,174	395	8,992	4,585
<i>Semi-finished steel</i>	<i>1,295</i>	<i>409</i>	<i>9,484</i>	<i>6,680</i>
Concrete reinforcing bars	99	533	1,806	21,948
Hollow steel bars	54	99	571	564
Merchant steel bars	1,518	1,432	11,999	22,934
Iron bars	53	101	296	383
Iron slabs .....	...	...	1	11
Boiler and other plate	35	28	157	343
Sheets, skelp and saw plate	861	1,164	6,742	12,745
Tin plate	9	4	211	7,210
Structural shapes	2,894	1,835	18,000	21,140
Sheet piling .....	...	1	94	1
Rails and rail fastenings	1,184	534	4,581	2,392
Welded pipe	369	358	2,519	3,229
Other pipe	176	236	1,022	1,916
Barbed wire	347	859	5,782	10,447
Round iron and steel wire	378	68	2,064	1,419
Flat wire and strip steel	168	113	1,689	1,103
Wire rope and strand	179	103	1,061	1,203
Other wire	189	85	1,193	689
Hoops and bands	3,303	5,664	13,535	21,496
Nails, tacks and staples	379	671	4,086	6,985
Bolts, nuts and rivets	18	38	179	136
Other finished steel	45	9	278	69
<i>Rolled and finished steel</i>	<i>12,258</i>	<i>13,935</i>	<i>76,866</i>	<i>138,363</i>
Cast iron pipe and fittings	148	...	724	199
Castings and forgings	125	111	818	767
Total	46,839	23,673	252,122	251,164

*Manganese content only.
†Chromium content only.
‡Silicon content only.

WASHINGTON, Sept. 29.—Making a gain of 31,063 gross tons, exports of iron and steel in August rose to 119,374 tons from 88,311 tons in July. The principal increase was in the scrap movement which in August totaled 70,145 tons, or 22,593 tons in excess of the outgoing shipments in July.

August imports were 46,839 tons, a decline of 5966 tons from those of July. This drop also was due to the scrap movement, incoming shipments decreasing to 9508 tons from 13,391 tons. There also was a decline in imports of ferromanganese and spiegeleisen, which fell to 4889 tons from 7252 tons. The largest increase in imports was in hoops and bands which rose to 3303 tons from 1842 tons.

Japan was the largest consumer of August exports, taking 54,157 tons of which 49,634 tons was scrap. The next largest consumer was Canada, which took 14,029 tons. Ordinarily the principal market for American exports of iron and steel, Canada not only was the largest supplier of imports in August, with a total of 16,229 tons, but the balance was in its favor by a margin of 2200 tons.

In addition to Canada and Japan, other important consumers of August scrap exports were Germany, 7000 tons; Italy, 6563 tons, and Poland, 3209 tons. Brazil took 1983 tons and Japan, 466 tons, of heavy rails. Of the 3091 tons of galvanized steel sheets exported, the Philippine Islands took 1689 tons. Japan took 2521 tons of the 7333 tons of tin plate shipped abroad, while Argentina took 1375 tons and Canada, 590 tons.

Sources of American Imports of Iron Ore

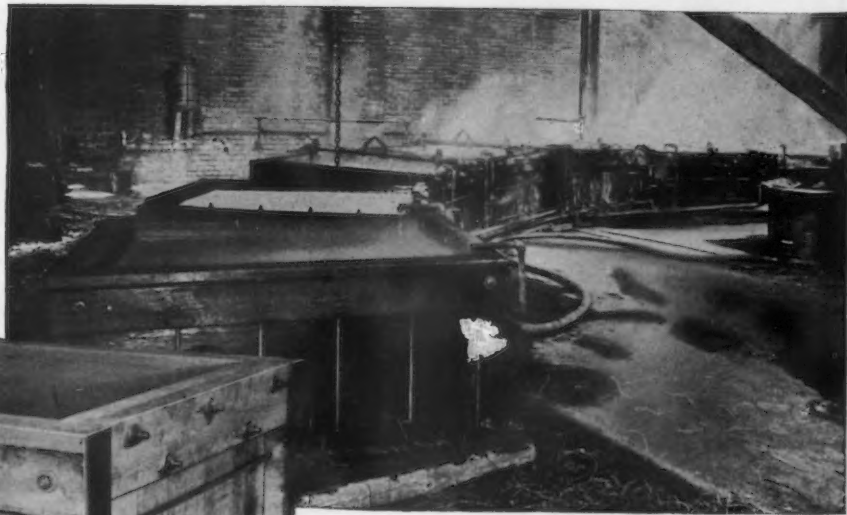
(In Gross Tons)

	August		Eight Months Ended August	
	1933	1932	1933	1932
Canada .....	...	...	...	807
Cuba	33,000	...	121,150	55,000
Chile	108,260	...	129,912	218,492
Spain .....	...	196	606	245
Sweden .....	...	...	...	7,037
French Africa .....	...	...	...	10,000
Russia .....	...	7,900	66,850	122,860
Other countries	17,679	17,196	56,877	84,942
Total	158,939	25,292	375,395	499,388

United States Imports of Pig Iron by Countries of Shipment

(In Gross Tons)

	August		Eight Months Ended August	
	1933	1932	1933	1932
United Kingdom .....	...	50	5,140	16,402
British India	8,260	1,440	40,959	23,944
Germany .....	...	40	284	175
Netherlands	6,176	959	42,983	36,401
Canada	3,413	...	4,419	138
France .....	...	...	...	...
Belgium .....	...	...	...	200
Norway .....	...	...	602	102
Sweden	177	4,709	2,980	5,131
All others	462	...	2,237	581
Total	18,488	7,198	99,554	83,074



● Pickling department of Wilson Steel Products Co., Chicago, showing 7 of 12 round-bottom pickling tanks for pickling coils of wire products. Tanks designed and constructed by Johnson & Carlson Co., Chicago, Ill.

● LEFT—Unusual type of round-bottom wooden pickling tank for pickling coils of hot rolled steel wire rod. Note the ingenuity of design to secure acid tightness at all joints. Fastened throughout with Monel Metal tie rods, washers and nuts. This is one of 12 similar tanks, manufactured for the Wilson Steel Products Co., Chicago, Ill.

MONEL METAL TIE RODS...

INSURE LEAK-TIGHT PICKLING TANK JOINTS

● Why let leaky tanks upset your pickling department routine when it's easy to make and keep the joints tight as a drum with Monel Metal tie rods?

These husky tank fastenings save your pickling room force extra work and prolong the service life of your equipment.

Monel Metal tie rods insure a leak-proof seal between tank sections. You can tighten them to the last turn without danger of breaking. That's because Monel Metal combines steel-like strength with maximum resist-

ance to acid or alkaline pickling solutions. Monel Metal tie rods are never guilty of corrosion-failure, and their flawless rolled structure defies thread-stripping.

At the same time, these tie rods are readily adaptable to any type of pickling tank. The round-bottomed tank illustrated shows how Monel Metal rods can be shaped to fit the most highly specialized tank design.

For further information about Monel Metal equipment in any form, consult your regular fabricator, or write us.



Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.



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Manufacturing EXECUTIVE WANTED

THE position of Manufacturing Manager is open in a large plant in the Middle West, making a very diversified line of electrical apparatus.

This is an unusual opportunity for one who has a broad knowledge of modern manufacturing methods and equipment, together with the executive ability to get results from a diversified organization. Applicants should have 15 to 20 years' actual experience. Address:

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Protective Painting of Metal Work

(Concluded from Page 23)

but with ordinary rolled steel it is difficult to avoid breakage of scale in places during transit and erection.

Painting on Rust

The rust left when drops of water, or even drops of acid, were placed on the surface and allowed to dry up, produced no premature failure when the whole surface was subsequently covered with paint and exposed outdoors. But the rust produced by exposing the metal outdoors for some weeks previous to painting caused rapid failure of the paint, especially when the painting was conducted shortly after dawn, when the rust was wet. Rust should always be removed as far as possible by vigorous wire brushing before painting. Its danger lies doubtless in its imperfect adhesion, its power of absorbing moisture, and possibly its content of electrolytes.

The invisible moisture film, present on bright steel when painted before dawn, caused premature failure as compared with similar specimens painted dry in the afternoon.

Salt shut in below the paint coat proved very harmful, far more so than salt outside the paint, as in marine tests. Drops of sodium chloride solution placed on bright steel and allowed to evaporate before paint was applied caused the paint to commence to rise locally, sometimes after a few weeks' exposure; similar coats without the salt drops gave protection for long periods.

Question of Pigments and Oils

Red lead for the lowest coat, with iron oxide for the other coats, proved to be a good combination (but this combination is not favored in all quarters, where a still tougher paint is preferred for the outer coat). Chromates appear excellent under some conditions, but may fail when the rain is acid; this falls in line with laboratory work which shows that while chromates prevent corrosion in neutral solutions, they stimulate corrosion in acid by depolarizing the hydrogen. Mixtures of chromates and basic oxides such as zinc oxide are therefore being tested.

Experiments have been carried out with a number of drying oils includ-

ing (1) raw linseed oil rich in "foots," (2) ordinary good raw linseed oil, (3) boiled linseed oil, (4) ordinary refined linseed oil, (5) special refined linseed specially free from foots, (6) tung oil, and several specially treated oils. The deleterious effects of foots on paints pigmented with iron oxide is marked, but red lead paints appear little affected; this difference is clearly due to the fact that small defects in the coat of a paint relying upon mechanical exclusion are far more important than those in paint containing an inhibiting pigment. Omitting the oil rich in foots, it may be said that almost any of these oils can give a rust inhibitive paint (provided, of course, that the pigment is suitable) and that the ratio of oil to pigment can usually be varied over a fairly wide range without hurting the protective value. It is felt, however, that in many commercial ready-made paints, the pigment content is too low.

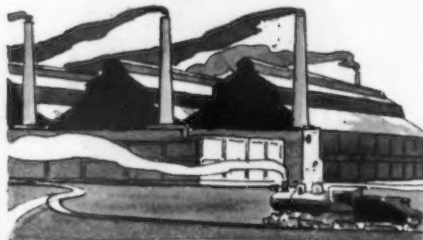
Use of Thinners and Driers

Considerable latitude in the amount of thinner is possible in the case of red lead paints. A series in which the proportion of turpentine was varied over wide limits showed that excellent protection was always obtained, provided that the paint was not so thin that the pigment particles gathered into clots, leaving channels of clear oil in between.

While with red lead, the thinner content over wide limits is almost immaterial, the facts are quite different for iron oxide paints; here the protective value falls off steadily as the thinner content is increased.

A paint rich in drier undergoes slow afterchanges and tends to perish; on the other hand, if rain falls on the paint coat before it is dry, the failure is very rapid indeed.

In the country air, single coats have given good protection for 3½ years, while in London it seems necessary to apply two coats of any paint to ensure a reasonable life for the coating. The Cambridge Laboratory roof proved fairly corrosive in the winter, but not in the summer. The marine air was definitely less corrosive than the urban atmosphere. At the gas works, the specimens became covered with fine coal dust and there was surprisingly little attack; the dust appeared to keep the specimens dry.



Motor Wheel Corporation, Lansing, Mich., has added a quarter-barrel to its line of Duo-Steel beer barrels placed on the market in July. Since the introduction of the barrel, production is reported to be maintained at 2,000 a day, with demand rapidly increasing.